ERRATA—Naval Academy Register 1898-'99.

Page 14. Lieut. W. F. Halsey, Assistant in the Dept. of Physics.

" 22. Naval Cadet R. A. Abernathy, Sea service, during the war with Spain, 2 months 27 days; total, 5 months 22 days.

" 41. Naval Cadet H. W. Osterhaus, Age at date of admission, 17 years 6 months.

ANNUAL REGISTER

OF THE

UNITED STATES NAVAL ACADEMY,

ANNAPOLIS, MD.

FIFTY-FOURTH ACADEMIC YEAR.

1898-'99.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1899.

CONTENTS.

THE UNITED STATES NAVAL ACADEMY.

The United States Naval Academy was founded in 1845 by the Hon. George Bancroft, Secretary of the Navy, in the Administration of President James K. Polk. It was formally opened October 10 of that year under the name of the Naval School, with Commander Franklin Buchanan as superintendent. It was placed at Annapolis, Md., on the land occupied by Fort Severn, which was given up by the War Department for the purpose. The course was fixed at five years, of which only the first year and the last were spent at the school, the intervening three years being passed at sea. This arrangement was not strictly adhered to, the exigencies of the service making it necessary, in many cases, to shorten the period of study. In January, 1846, four months after the opening of the school, the students consisted of thirty-six midshipmen of the date of 1840, who were preparing for the examination for promotion; thirteen of the date of 1841, who were to remain until drafted for service at sea; and seven acting midshipmen, appointed after September of the previous year. The midshipmen of the date of 1840 were the first to be graduated, finishing their limited course in July, 1846, and they were followed in order by the subsequent dates until the reorganization of the school in 1850.

In September, 1849, the following board was appointed to revise the plan and the regulations of the Naval School:

Commander William B. Shubrick,
Commander Franklin Buchanan,
Commander Samuel F. Du Pont,
Commander George P. Upshur,
Surgeon W. S. W. Ruschenberger,
Professor William Chauvenet,
Captain Henry Brewerton, United States Army.

The plan reported by the board was approved, and went into operation July 1, 1850. The new organization provided for a course of seven years, the first two and the last two at the school, and the three intermediate years at sea. The school was placed under the supervision of the Bureau of Ordnance and Hydrography, and its name was changed to the United States Naval Academy. The corps of professors was enlarged, the course was extended, and the system of separate departments with executive heads was fully adopted. It was provided that a Board of Visitors should make an annual inspection of the Academy and report upon its condition to the Secretary of the Navy. A suitable vessel was attached to the Academy as a practice ship, and the annual practice cruises were begun.

After the system had been in operation a year new changes were proposed, and the recommendations of the academic board on the subject were referred to the board of examiners for the year 1851, composed of the following-named officers:

Commodore David Conner,
Captain Samuel L. Breese,
Commander C. K. Stribling,
Commander A. Bigelow,
Commander Franklin Buchanan,
Lieutenant Thomas T. Craven.

The change recommended by the board of examiners, and adopted by the Department, consisted mainly in leaving out the requirement of three years of

sea service in the middle of the course, thus making the four years of study consecutive. The practice cruise supplied the place of the omitted sea service, and gave better opportunities for training. The change went into operation in November, 1851, together with other improvements recommended by the board. This system has been continued, with some slight modifications, to the present time. The first class to receive the benefit of it was that which entered in 1851. Six members of this class completed the course in three years and were graduated in June, 1854; the rest of the class followed in 1855.

In May, 1861, on the outbreak of the war, the Academy was moved to Newport, R. I. The three upper classes were detached and ordered to sea, and the remaining acting midshipmen were quartered in the Atlantic House and on board the frigates *Constitution* and *Santee*. In the summer of 1865 the Academy was brought back to Annapolis, where it has since remained.

When the Bureau of Navigation was established, July 5, 1862, the Academy was placed under its supervision; March 1, 1867, it was placed under the direct care and supervision of the Navy Department, the administrative routine and financial management being still conducted through the Bureau. On the 11th of March, 1869, this official connection with the Bureau ceased, but was renewed by the general order of the Navy Department issued June 25, 1889.

The term of the academic course was changed by law, March 3, 1873, from four to six years. The change took effect with the class that entered in the following summer.

In 1866 a class of acting third assistant engineers was ordered to the Academy for instruction. The course embraced the subjects of steam engineering, mechanism, chemistry, mechanics, and practical exercises with the steam engine and in the machine shop. This class was graduated in June, 1868, together with two cadet engineers who had entered the Academy in 1867. After an interval of four years, in October, 1871, a new class of cadet engineers was admitted. This class followed a two years' course, somewhat more extended than that of the class of 1868, and was graduated in 1873. In 1872 and 1873 new classes were admitted, the first of which left the Academy in 1874 and the second in 1875. By an act of Congress approved February 24, 1874, the course of instruction for cadet engineers was made four years instead of two; the new provision was first applied to the class entering the Academy in the year 1874. This class was graduated in June, 1878.

By an act of Congress approved August 5, 1882, it was provided that from that date "there shall be no appointments of cadet-midshipmen or cadet-engineers at the Naval Academy, but in lieu thereof naval cadets shall be appointed from each Congressional district and at large, as now provided by law for cadet-midshipmen, and all the undergraduates at the Naval Academy shall hereafter be designated and called 'naval cadets;' and from those who successfully complete the six years' course, appointments shall hereafter be made as it is necessary to fill vacancies in the lower grades of the Line and Engineer Corps of the Navy and of the Marine Corps: *And provided further*, That no greater number of appointments into these grades shall be made each year than shall equal the number of vacancies which has occurred in the same grades during the preceding year; such appointments to be made from the graduates of the year, at the conclusion of their six years' course, in the order of merit, as determined by the academic board of the Naval Academy; the assignment to the various corps to be made by the Secretary of the Navy upon the recommendation of the academic board. But nothing herein contained shall reduce the number of appointments from such graduates below ten in each year, nor deprive of such appointment any graduate who may complete the six years' course during the year eighteen hundred and eighty-two. And if there be a surplus of graduates, those who do not receive such appointment shall be given a certificate of graduation,

an honorable discharge, and one year's sea pay, as now provided by law for cadet-midshipmen; and so much of section fifteen hundred and twenty-one of the Revised Statutes as is inconsistent herewith is hereby repealed.

"That any cadet whose position in his class entitles him to be retained in the service may, upon his own application, be honorably discharged at the end of the four years' course at the Naval Academy, with a proper certificate of graduation."

In 1886 a special course of instruction in physiology and hygiene was established, in accordance with an act of Congress approved May 20 of that year.

The act of Congress approved March 2, 1889, provides that "the Academic Board of the Naval Academy shall on or before the thirtieth day of September in each year separate the first class of naval cadets then commencing their fourth year into two divisions, as they may have shown special aptitude for the duties of the respective corps, in the proportion which the aggregate number of vacancies occurring in the preceding fiscal year ending on the thirtieth day of June in the lowest grades of commissioned officers of the Line of the Navy and Marine Corps of the Navy shall bear to the number of vacancies to be supplied from the Academy occurring during the same period in the lowest grade of commissioned officers of the engineer corps of the Navy; and the cadets so assigned to the Line and Marine Corps division of the first class shall thereafter pursue a course of study arranged to fit them for service in the Line of the Navy, and the cadets so assigned to the Engineer Corps division of the first class shall thereafter pursue a separate course of study arranged to fit them for service in the Engineer Corps of the Navy, and the cadets shall thereafter, and until final graduation, at the end of their six years' course, take rank by merit with those in the same division, according to the merit marks; and from the final graduates of the Line and Marine Corps division, at the end of their six years' course, appointments shall be made hereafter as it shall be necessary to fill vacancies in the lowest grades of commissioned officers of the Line of the Navy and Marine Corps; and the vacancies in the lowest grades of the commissioned officers of the Engineer Corps of the Navy shall be filled in like manner by appointments from the final graduates of the Engineer division at the end of their six years' course: *Provided*, That no greater number of appointments into the said lowest grades of commissioned officers shall be made each year than shall equal the number of vacancies which shall have occurred in the same grades during the fiscal year then current; such apppintments to be made from the final graduates of the year, in the order of merit as determined by the Academic Board of the Naval Academy, the assignment to be made by the Secretary of the Navy upon the recommendation of the Academic Board at the conclusion of the fiscal year then current; but nothing contained herein or in the naval appropriation act of August fifth, eighteen hundred and eighty-two, shall reduce the number of appointments of final graduates at the end of their six years' course below twelve in each year to the Line of the Navy, and not less than two shall be appointed annually to the Engineer Corps of the Navy, nor less than one annually to the Marine Corps; and if the number of vacancies in the lowest grades aforesaid, occurring in any year shall be greater than the number of final graduates of that year, the surplus vacancies shall be filled from the final graduates of following years, as they shall become available."

"That after the fourth day of March, eighteen hundred and eighty-nine, the minimum age of admission of cadets to the Academy shall be fifteen years and the maximum age twenty years."

In October, 1897, a post-graduate course in Naval Architecture, for the education of officers for the Construction Corps of the Navy, was established; and a class was formed from the naval cadets that had finished the four years' course in that year.

SUPERINTENDENTS

OF THE

UNITED STATES NAVAL ACADEMY.

	Assumed command.
Commander Franklin Buchanan	Sept. 3, 1845
Commander George P. Upshur	Mar. 15, 1847
Commander Cornelius K. Stribling	July 1, 1850
Commander Louis M. Goldsborough	Nov. 1, 1853
Captain George S. Blake	Sept. 15, 1857
Rear Admiral David D. Porter	Sept. 9, 1865
Commodore John L. Worden	Dec. 1, 1869
Rear Admiral C. R. P. Rodgers	Sept. 22, 1874
Commodore Foxhall A. Parker	July 1, 1878
Rear Admiral George B. Balch	Aug. 2, 1879
Rear Admiral C. R. P. Rodgers	June 13, 1881
Captain F. M. Ramsay	Nov. 14, 1881
Commander W. T. Sampson	Sept. 9, 1886
Captain R. L. Phythian	June 30, 1890
Captain P. H. Cooper	Nov. 15, 1894
Rear Admiral F. V. McNair	July 15, 1898

BOARD OF VISITORS, JUNE, 1898.

Honorable S. G. Hilborn, Representative in Congress, California, *President.*
Professor Charles E. Munroe, Dean Columbian University, Washington, D. C., *Vice-President.*
Honorable Eugene Hale, United States Senator, Maine.
Honorable Donelson Caffery, United States Senator, Louisiana.
Honorable Irving P. Wanger, Representative in Congress, Pennsylvania.
Honorable Charles G. Wheeler, Representative in Congress, Kentucky.
Dr. Amos Babcock, New Hampton, Iowa.
Honorable H. E. Sadler, Sedan, Kans.
Professor John L. Lampson, Peabody Normal College, Nashville, Tenn.
James Phillips, jr., Esq., Fitchburg, Mass.
Edward C. Hinman, Battlecreek, Mich.
John M. Boyer, Esq., London, Ohio.
Lieutenant C. M. Stone, U. S. N., *Secretary to the Board.*

COMMITTEES.

1. Discipline, drill, practical exercises, administration and police.—Hon. C. K. Wheeler, Dr. Amos Babcock, and John M. Boyer, Esq.

2. Conditions of admission to and discharge from the Academy; subjects of study and standard of scholarship; seamanship, ordnance, navigation, steam, mathematics, physics, mechanics, English, languages, drawing, physiology, and hygiene.—Hon. H. E. Sadler, Prof. J. L. Lampson, and Prof. C. E. Munroe.

3. Grounds, buildings, sanitary conditions, finance, and library.—Hon. Irving P. Wanger, Edward C. Hinman, Esq., and James Phillips, jr., Esq.

4. Final report.—Hon. S. G. Hilborn, Hon. I. P. Wanger, Hon. C. K. Wheeler, Dr. A. Babcock, Prof. C. E. Munroe, and E. C. Hinman, Esq.

ACADEMIC CALENDAR.

1898–1899.

1898.		
Oct.	1.—Beginning of first term	Saturday.
1899.		
Jan.	23–28.—Semi-annual examination	Monday–Saturday.
Jan.	28.—End of first term	Saturday.
May	15.—Examination of candidates for admission as naval cadets	Monday.
May	31.—End of academic year, 1898–'99	Wednesday.
May	29–June 3.—Annual examination	Monday–Saturday.
Sept.	1.—Examination of candidates for admission as naval cadets	Friday.
Oct.	1.—Beginning of first term, 1899–1900	Sunday.

The academic months end on the following days:

1898–1899.

October	Oct. 29	February	Feb. 25
November	Nov. 26	March	Mar. 25
December	Dec. 24	April	Apr. 22
January	Jan. 21	May	May 20

1899–1900.

October	Oct. 28	December	Dec. 23
November	Nov. 25	January	Jan 20

CALENDAR FOR 1898-'99.

SEPTEMBER.

S.	M.	T.	W.	T.	F.	S.
--	--	--	--	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	--

OCTOBER.

--	--	--	--	--	--	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	--	--	--	--	--

NOVEMBER.

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6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	--	--	--

DECEMBER.

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4	5	6	7	8	9	10
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18	19	20	21	22	23	24
25	26	27	28	29	30	31

JANUARY.

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	--	--	--	--

FEBRUARY.

--	--	--	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	--	--	--	--

MARCH.

--	--	--	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	--

APRIL.

S.	M.	T.	W.	T.	F.	S.
--	--	--	--	--	--	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	--	--	--	--	--	--

MAY.

--	1	2	3	4	5	6
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14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	--	--	--

JUNE.

--	--	--	--	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	--

JULY.

--	--	--	--	--	--	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	--	--	--	--	--

AUGUST.

--	--	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	--	--

SEPTEMBER.

--	--	--	--	--	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

OCTOBER.

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	--	--	--	--

OFFICERS, PROFESSORS, AND INSTRUCTORS

ATTACHED TO THE

UNITED STATES NAVAL ACADEMY.

Superintendent,

REAR ADMIRAL F. V. McNAIR.

Assistant to the Superintendent in Charge of Buildings and Grounds,

Lieutenant Commander E. K. Moore.

Assistant to the Superintendent and Secretary of the Academic Board,

Lieutenant John H. Shipley.

Commandant of Cadets and Head of the Department of Discipline,

COMMANDER C. T. HUTCHINS.

Assistants,

Lieutenant Hugo Osterhaus,
Lieutenant E. J. Dorn,
Lieutenant G. M. Stoney,
Lieutenant Alexander Sharp.

SEAMANSHIP.

Head of Department,

LIEUTENANT A. M. KNIGHT.

Assistants,

Lieutenant C. A. Gove,
Lieutenant D. P. Menefee.

ORDNANCE.

Head of Department,

LIEUTENANT-COMMANDER R. R. INGERSOLL.

Assistants,

Lieutenant W. F. Fullam,
Lieutenant H. S. Knapp.

Sword Master,

A. J. Corbesier.

Assistant Sword Masters,

J. B. Retz,
George Heintz.

NAVIGATION.

Head of Department,

LIEUTENANT C. W. BARTLETT.

Assistants,

Lieutenant E. H. Tillman,
Lieutenant W. C. P. Muir.

STEAM ENGINEERING AND DRAWING.

Head of Department,

CHIEF ENGINEER GEORGE H. KEARNY.

Assistants,

Chief Engineer F. J. Schell,
Passed Assistant Engineer F. H. Conant,
Passed Assistant Engineer O. W. Koester,
Passed Assistant Engineer U. T. Holmes,
Passed Assistant Engineer G. W. Laws,
Assistant Engineer M. E. Trench,
Assistant Professor C. F. Blauvelt.

MECHANICS.

Head of Department,

COMMANDER HARRY KNOX.

Assistants,

Lieutenant Harry George,
Professor W. W. Johnson, A. M.

PHYSICS.

Head of Department,

PROFESSOR N. M. TERRY, A. M., Ph. D.

Assistants,

Lieutenant W. H. G. Bullard,
Lieutenant G. F. Cooper,
Ensign W. S. Crosley,
Professor P. J. Dashiell, Ph. D.

MATHEMATICS.

Head of Department,

PROFESSOR W. W. HENDRICKSON.

Assistants,

Lieutenant W. H. Faust,
Lieutenant C. M. Stone,
Lieutenant C. B. Brittain,
Ensign E. T. Pollock.

ENGLISH.

Head of Department,

LIEUTENANT-COMMANDER PERRY GARST.

Assistants,

Lieutenant C. N. Atwater,
Lieutenant R H. Jackson,
Lieutenant A. B. Hoff,
Professor A. N. Brown,
Professor Frederick Willing.

LANGUAGES.

Head of Department,

LIEUTENANT H. P. HUSE.

Assistants,

Professor J. Leroux,
Professor H. Marion,
Professor S. Garner, Ph. D.,
Assistant Professor P. J. des Garennes, A. M.

In Charge of Branch, Naval Construction, Post-Graduate Course,

Naval Constructor L. Spear.

PHYSIOLOGY AND HYGIENE.

In Charge of Special Instruction,

Passed Assistant Surgeon M. R. Pigott.

Instructor in Physical Training,

Mathew Strohm.

OFFICERS NOT ATTACHED TO ACADEMIC STAFF.

Lieutenant-Commander R. Wainwright, *in Charge of Ships.*
Medical Inspector William S. Dixon.
Passed Assistant Surgeon L. L. von Wedekind.
Pay Director T. T. Caswell, *Pay Officer and General Storekeeper.*
Paymaster J. Porter Loomis, *Commissary and Cadets' Storekeeper.*
Passed Assistant Engineer W. H. Allderdice, *in Charge of Machinery Afloat.*
Chaplain H. H. Clark.
Professor M. Oliver, *Librarian.*

Santee and Ships.

Boatswain J. S. Sinclair.
Boatswain Charles F. Pierce.
Carpenter J. F. Keen.
Gunner F. C. Messenger.

Mates.

Charles J. Murphy.
Ernest Brown.
A. R. Nickerson.
C. L. Weiss.

Marine Officers.

Captain R. Wallach, *Commanding Marines.*
Second Lieutenant H. W. Carpenter.
Second Lieutenant C. S. Hill.
Second Lieutenant J. F. McGill.

ACADEMIC BOARD.

The Superintendent.
The Commandant of Cadets.
The Head of the Department of Seamanship.
The Head of the Department of Ordnance.
The Head of the Department of Navigation.
The Head of the Departments of Steam Engineering and Drawing.
The Head of the Department of Mechanics.
The Head of the Department of Physics.
The Head of the Department of Mathematics.
The Head of the Department of English.
The Head of the Department of Languages.

CADET OFFICERS OF THE UNITED STATES NAVAL ACADEMY.

CADET LIEUTENANT-COMMANDER,

H. G. SPARROW.

CADET LIEUTENANT AND ADJUTANT,

A. BUCHANAN.

CADET PASSED ASSISTANT ENGINEER,

G. A. BISSET.

CADET ASSISTANT ENGINEER,

E. G. SADLER.

CADET CHIEF PETTY OFFICER,

C. E. COURTNEY.

CADET LIEUTENANTS,

H. M. GLEASON,
E. A. WEICHERT,
J. K. TAUSSIG,
S. B. THOMAS.

CADET JUNIOR LIEUTENANTS,

C. H. WOODWARD,
C. H. FISCHER,
E. B. FENNER,
S. I. M. MAJOR.

CADET ENSIGNS,

J. W. L., CLEMENT, Jr.,
E. B. LARIMER,
J. W. GREENSLADE,
F. P. HELM.

CADET PETTY OFFICERS OF THE FIRST CLASS.

First Division.	*Second Division.*	*Third Division.*	*Fourth Division.*
J. E. BAILEY,	W. C. WOOD,	V. A. KIMBERLY,	W. M. HUNT,
J. H. TOMB,	H. E. LACKEY,	C. C. BLOCH,	L. S. SHAPLEY,
J. E. MATHEWS,	C. SHACKFORD,	W. R. SAYLES,	H. H. ROYALL,
F. H. YATES.	P. B. DUNGAN.	H. L. BRINSER.	A. W. JOHNSON.

CADET PETTY OFFICERS OF THE SECOND CLASS.

First Division.	*Second Division.*	*Third Division.*	*Fourth Division.*
C. W. FORMAN,	J. T. BOWERS,	C. E. MORGAN,	A. E. WATSON,
J. E. LEWIS,	E. C. KALBFUS,	R. E. POPE,	J. B. GILMER,
J. W. TIMMONS,	F. O. BRANCH,	R. D. WHITE,	C. S. FREEMAN,
R. L. BERRY.	W. G. MITCHELL.	J. C. KRESS.	D. P. MANNIX.

SUMMER CRUISE, 1898.

The annual cruise of the practice ships was suspended during the war with Spain. One hundred and twenty-three of the cadets pursuing the four-years' course at the Academy were ordered to ships actively engaged in the operations of the war.

CLASSES OF THE NAVAL CADETS AT THE BEGINNING OF THE ACADEMIC YEAR 1898-'99.

[Corrected to October 4, 1898.]

Naval Cadets of the class appointed in 1893, performing required service afloat—Line Division—36 members.

Order of general merit.	Name.	State from which appointed.	Date of admission.
1	Du Bose, William Gunnell[1]	Georgia	Sept. 6, 1893
2	Eggert, Ernest Frederick[1]	Michigan	Sept. 6, 1893
3	Yarnell, Harry Ervin	Iowa	Sept. 6, 1893
4	Perrill, Harlan Page	Indiana	Sept. 6, 1893
5	Hepburn, Arthur Japy	Pennsylvania	Sept. 22, 1893
6	Theleen, David Elias	Wisconsin	Sept. 6, 1893
7	Pressey, Alfred Warren	Nebraska	May 19, 1893
8	Jones, Needham Lee	Mississippi	Sept. 6, 1893
9	Reynolds, William Herbert	Georgia	Sept. 6, 1893
10	Overstreet, Luther Martin	Nebraska	Sept. 6, 1893
11	Hart, Thomas Charles	Michigan	May 19, 1893
12	Murfin, Orin Gould	Ohio	Sept. 6, 1893
13	Sargent, Leonard Rundlett	Minnesota	Sept. 6, 1893
14	Miller, Cyrus Robinson	California	Sept. 6, 1893
15	Chase, Gilbert	Virginia	Sept. 6, 1893
16	White, William Russell	Arizona	Sept. 6, 1893
17	Graeme, Joseph Wright	Pennsylvania	Sept. 6, 1893
18	Houston, Victor Stuart	South Dakota	Sept. 22, 1893
19	Sexton, Walter Roswell	Illinois	May 19, 1893
20	Boyd, David French, jr	Alabama	May 19, 1893
21	Holman, Frederic Ralph	Iowa	May 19, 1893
22	Falconer, Walter Maxwell	Ohio	Sept. 6, 1893
23	McCarthy, Albert Henry	Iowa	Sept. 6, 1893
24	Williams, Hilary	Indiana	Sept. 6, 1893
25	McDowell, Willis	Pennsylvania	May 19, 1893
26	Duncan, Oscar Dibble	Alabama	Sept. 6, 1893
27	Smith, Arthur St. Clair, jr	Iowa	Sept. 6, 1893
28	Henderson, Robert William	Ohio	Sept. 22, 1893
29	Kautz, Austin	Washington	May 19, 1893
30	Owens, Charles Truesdale	Pennsylvania	Sept. 6, 1893
31	Giles, William Pinkney	Texas	May 20, 1893
32	Asserson, William Christian	New York	Sept. 25, 1893
33	Owen, Alfred Crosby	District of Columbia	Sept. 6, 1893
34	Magill, Samuel George, jr	North Dakota	May 19, 1893
35	Landis, Irwin Franklin	Kansas	Sept. 6, 1893
36	Kempff, Clarence Selby	California	May 19, 1893

Engineer Division—10 members.

1	Mahoney, Daniel Sullivan	Michigan	Sept. 6, 1893
2	Collins, Henry Lafayette	Pennsylvania	Sept. 6, 1893
3	Richardson, Louis Clark	South Carolina	Sept. 6, 1893
4	Graham, Andrew Thomas	Illinois	Sept. 6, 1893
5	Jenson, Henry Norman	Wisconsin	Sept. 6, 1893
6	Pratt, Peter Lloyd	Illinois	May 19, 1893
7	Leahy, William Daniel	Wisconsin	May 19, 1893
8	Webber, George	Arkansas	Sept. 6, 1893
9	Keenan, Ernest Clinton	New York	Sept. 6, 1893
10	Van Orden, George	Michigan	May 19, 1893

[1] Pursuing post-graduate course in Naval Architecture at Naval Academy.

Naval Cadets of the class appointed in 1894, performing required service afloat—

Line Division—28 members.

Order of general merit.	Name.	State from which appointed.	Date of admission.
1	Halligan, John, jr [1]	Massachusetts	Sept. 6, 1894
2	Williams, Henry [1]	Maryland	Sept. 6, 1894
3	Watts, William Carleton [1]	Pennsylvania	Sept. 22, 1894
4	Smith, George Leonard	New Hampshire	Sept. 6, 1894
5	Briggs, Wilbur Gerheart	New York	Sept. 6, 1894
6	Marble, Ralph Norris, jr	Minnesota	May 19, 1894
7	Hand, James Alexander, jr	South Dakota	Sept. 6, 1894
8	Cotten, Lyman Atkinson	North Carolina	Sept. 6, 1894
9	Woods, Edward	Massachusetts	May 19, 1894
10	Boone, Charles	Ohio	Sept. 6, 1894
11	McIntyre, Edward William	California	Sept. 6, 1894
12	Pinney, Frank Lucius [1]	Connecticut	Sept. 6, 1894
13	Cronan, William Pigott	Connecticut	Sept. 6, 1894
14	Macy, Ulysses Samuel	Missouri	Sept. 6, 1894
15	Briggs, Zeno Everett	Nebraska	Sept. 22, 1894
16	Tardy, Walter Benjamin	Arkansas	May 19, 1894
17	Tarrant, William Theodore	Texas	Sept. 6, 1894
18	Abele, Clarence Arthur	Massachusetts	Sept. 6, 1894
19	Williams, Yancy Sullivan	South Carolina	Sept. 6, 1894
20	Johnson, Thomas Lee	Kansas	May 19, 1894
21	Pettengill, George Tilford	Idaho	Sept. 22, 1894
22	Sweet, George Cook	New York	Sept. 22, 1894
23	Evans, Franck Taylor	At large	Sept. 6, 1894
24	Brown, Morris Hamilton	Indiana	May 19, 1894
25	Hanrahan, David Carlisle	Wisconsin	May 19, 1894
26	Babcock, John Franklin	New York	Sept. 22, 1894
27	Nelson, Charles Preston	Massachusetts	May 19, 1894
28	Roper, Walter Gordon	Georgia	Sept. 22, 1894

Engineer Division—11 members.

1	Wright, Henry Tutwiler [1]	Alabama	Sept. 6, 1894
2	Elson, Herman Jacob	Mississippi	May 19, 1894
3	Sheffield, Fletcher Lamar	Georgia	Sept. 6, 1893
4	Dinger, Henry Charles	Wisconsin	May 19, 1894
5	Mitchell, Alexander Neely	Ohio	Sept. 6, 1894
6	Shane, Louis	Nebraska	Sept. 6, 1894
7	Faller, Guy William	Wisconsin	May 19, 1894
8	Wells, William Benefiel	Iowa	May 19, 1894
9	Constien, Edward Theodore	Pennsylvania	May 19, 1894
10	Schofield, John Anderson	Missouri	Sept. 6, 1894
11	Graham, John Sisson	Colorado	May 19, 1884

[1] Pursuing post-graduate course in Naval Architecture at Naval Academy.

Naval Cadets of the First Class—Line Division—42 members.

Name.	State from which appointed.	Date of admission.	Sea service.					
			In practice ships.		During war with Spain.		Total.	
			Months.	Days.	Months.	Days.	Months.	Days.
Bailey, John Eliot	Michigan	May 20, 1895	8	10	3	0	11	10
Bloch, Claude Charles	Kentucky	Sept. 6, 1895	5	17	3	7	8	24
Bowers, John Treadwell	New Jersey	Sept. 20, 1895	5	17	2	23	8	10
Branch, Frank Oak	Indiana	Sept. 6, 1895	5	17	2	22	8	9
Brinser, Harry Lerch	Pennsylvania	Sept. 6, 1895	5	17	2	16	8	3
Buchanan, Allen	Indiana	Sept. 6, 1895	5	17	2	21	8	8
Clement, James Wilkinson Legare, jr	South Carolina	Sept. 27, 1895	5	17	2	23	8	10
Cole, Cyrus Willard	Ohio	Sept. 20, 1895	5	17	2	23	8	10
Courtney, Charles Edward	New York	May 20, 1895	8	10	2	21	11	1
Dungan, Paul Baxter	Nebraska	Sept. 6, 1895	5	17	2	22	8	9
Fenner, Edward Blaine	New York	May 20, 1895	8	10	2	22	11	2
Fischer, Charles Hermann	Pennsylvania	Sept. 6, 1895	5	17	3	2	8	19
Forman, Charles William	Illinois	Sept. 6, 1895	5	17	2	23	8	10
Gilmer, James Blair	Virginia	May 19, 1894	11	3	2	22	13	25
Gleason, Henry Miller	Kansas	May 20, 1895	8	10	3	18	11	28
Greenslade, John Wills	Ohio	May 20, 1895	8	10	3	3	11	13
Helm, Frank Pinckney, jr	Kentucky	May 20, 1895	8	10	2	23	11	3
Hunt, Walter Merrill	Maine	Sept. 12, 1895	5	17	2	24	8	11
Johnson, Alfred Wilkinson	At large	May 20, 1895	8	10	3	2	11	12
Kalbfus, Edward Clifford	At large	May 20, 18 5	8	10	2	16	10	26
Kimberly, Victor Ashfield	Massachusetts	Sept. 6, 1895	5	17	3	9	8	26
Lackey, Henry Ellis	At large	May 20, 1895	8	10	2	22	11	3
Larimer, Edgar Brown	Kansas	Sept. 6, 1895	5	17	2	23	8	10
Lewis, John Earl	Minnesota	Sept. 6, 1895	5	17	3	8	8	15
Major, Samuel Ira Monger	Kentucky	Sept. 20, 1895	5	17	2	22	8	9
Mathews, James Edward	Illinois	May 20, 1895	8	10	3	7	11	17
Morgan, Charles Elmer	West Virginia	Sept. 6, 1895	5	17	2	23	8	10
Pope, Ralph Elton	Nebraska	May 20, 1895	8	10	2	13	10	23
Royall, Hilary Herbert	Alabama	May 20, 1895	8	10	2	22	11	5
Sayles, William Randall	Rhode Island	May 20, 1895	8	10	2	14	10	24
Shackford, Chauncey	New Jersey	Sept. 6, 1895	5	17	2	23	8	10
Shapley, Lloyd Stowell	Missouri	May 30, 1895	8	10	2	20	11	0
Sparrow, Herbert George	Ohio	Sept. 6, 1895	5	17	3	6	8	23
Taussig, Joseph Knefler	At large	June 5, 1895	8	10	2	22	11	5
Thomas, Samuel Brown	At large	May 31, 1895	8	10	2	23	11	3
Tomb, James Harvey	Missouri	Sept. 6, 1895	4	6	3	6	7	12
Watson, Adolphus Eugene	At large	May 30, 1895	8	10	3	2	11	12
Weichert, Ernest Augustus	Connecticut	Sept. 6, 1895	5	17	3	6	8	23
White, Richard Drace	Missouri	May 20, 1895	8	10	2	27	11	7
Wood, Welborn Cicero	Georgia	Sept. 6, 1895	5	17	2	14	8	1
Woodward, Clark Howell	Georgia	Sept. 6, 1895	5	17	2	23	8	10
Yates, Alexander Fred Hammond	Maine	May 20, 1895	8	10	2	24	11	4

Engineer Division—11 members.

Name.	State from which appointed.	Date of admission.	Sea service—					
			In practice ships.		During war with Spain.		Total.	
			Months.	Days.	Months.	Days.	Months.	Days.
ckner, John Taliaferro	Kentucky	May 20, 1895	8	10	2	22	11	2
sset, Guy Aloysius	Kentucky	Sept. 6, 1895	5	17	2	22	8	9
nbs, James Rockwell	Illinois	Sept. 6, 1895	5	17	2	7	7	24
ans, Herbert Heard	Mississippi	Sept. 6, 1895	5	17	2	23	8	10
tch, Charles Byron, jr	Illinois	Sept. 6, 1895	5	17	1	27	7	14
rne, Frederick Joseph	New York	May 20, 1895	8	10	2	19	10	29
dison, Zachariah Hervey	Illinois	Sept. 6, 1894	6	20	3	2	9	22
ller, William Siebel	Texas	Sept. 20, 1895	5	17	3	3	8	20
rrison, Farmer	Arkansas	Sept. 6, 1895	5	17	2	20	8	7
ller, Everit Jay	Kansas	Sept. 20, 1895	5	17	2	24	8	11
ncent, Roe Willis	Pennsylvania	Sept. 6, 1895	5	17	2	23	8	10

Naval Cadets of the Second Class—64 members.

Name.	State from which appointed.	Date of admission	Sea service—					
			In practice ships.		During war with Spain.		Total.	
			Months.	Days.	Months.	Days.	Months.	Days.
Abernathy, Robert Andrew	Tennessee	Sept. 5, 1896	2	25	0	0	2	25
Arnold, Clarence Lamont	Indiana	Sept. 5, 1896	2	25	0	0	2	25
Barthalow, Benjamin Grady	Ohio	Sept. 5, 1896	2	25	0	0	2	25
Berrien, Frank Dunn	Iowa	Sept. 5, 1896	2	25	3	6	6	1
Berry, Robert Lawrence	Kentucky	May 20, 1896	2	25	2	11	5	6
Bricker, William Franklin	Pennsylvania	Sept. 19, 1896	2	25	2	26	5	21
Bryant, Samuel Wood	Pennsylvania	Sept. 5, 1896	2	25	2	20	5	15
Bulmer, Bayard Taylor	Nevada	Sept. 5, 1896	2	25	0	0	2	25
Caffery, John Murphy	Louisiana	Sept. 5, 1896	2	25	1	28	4	23
Cage, Harry Kimball	Texas	May 20, 1896	2	25	0	0	2	25
Case, William Stanhope	Illinois	Sept. 6, 1895	5	17	1	15	7	2
Church, John Gaylord	Ohio	May 20, 1896	2	25	3	10	6	5
Cocke, Herbert Claiborne	Virginia	May 20, 1896	8	10	1	29	10	9
Comfort, James Hall	Missouri	May 20, 1896	2	25	3	9	6	4
Crittenden, Kirby Barnes	Missouri	Sept. 5, 1896	2	25	0	0	2	25
Defrees, Joseph Rollie	Illinois	May 20, 1896	2	25	0	0	2	25
Dodd, Edwin Horace	Illinois	Sept. 5, 1896	2	25	0	0	2	25
Doyle, Stafford Henry Rahall	South Carolina	May 20, 1896	5	17	0	0	5	17
Ellis, Hayne	Georgia	Sept. 5, 1896	2	25	2	8	5	3
Ferguson, William Burden, jr	North Carolina	May 20, 1896	2	25	0	0	2	25
Foley, Paul	New York	Sept. 5, 1896	2	25	3	5	6	0
Freeman, Charles Seymour	Pennsylvania	Sept. 5, 1896	2	25	2	18	5	13
Gannon, Sinclair	Texas	June 3, 1896	2	25	0	0	2	25
Gardiner, Carlos Alfonso	Illinois	May 20, 1896	2	25	1	9	4	9
Hellweg, Julius Frederick	Maryland	Sept. 5, 1896	2	25	3	14	6	4
Howard, Abram Claude	Illinois	Sept. 5, 1896	2	25	2	22	5	17
Huff, Charles Peabody	Missouri	Sept. 5, 1896	2	25	2	16	5	11
Hyland, John Joseph	Massachusetts	Sept. 19, 1896	2	25	2	6	5	1
Jackson, Edward Sharpless, jr	Pennsylvania	May 22, 1896	2	25	0	0	2	25
[1] Jeffers, William Nicholson	New York	Sept. 20, 1895	2	22	2	25	5	17
Johnston, Huntington	Oregon	Sept. 19, 1896	2	25	2	12	5	7
Kear, Carleton Romig	Ohio	May 20, 1896	2	25	2	4	4	29
Keating, Arthur Barnes	Maryland	Sept. 19, 1896	2	25	3	10	6	5
Kress, James Chatham	Pennsylvania	May 20, 1897	0	0	2	27	2	27
Landenberger, George Bertram	Pennsylvania	May 20, 1896	2	25	0	0	2	25
Landram, Clarence Elmer	Kentucky	Sept. 5, 1896	2	25	2	15	5	10
McEntee, William	Minnesota	May 20, 1896	2	25	0	0	2	25
Mannix, Daniel Pratt	At large	May 20, 1897	0	0	2	21	2	21
Menner, Robert Tryon	Pennsylvania	Sept. 5, 1896	2	25	0	0	2	25
Mitchell, Willis Gemmill	Pennsylvania	Sept. 5, 1896	2	25	2	21	5	16
Morris, Robert	Utah	Sept. 5, 1896	2	25	1	26	4	21
Naile, Frederick Raymonde	Pennsylvania	Sept. 5, 1896	2	25	2	21	5	16
Noa, Loveman	Tennessee	Sept. 5, 1896	2	25	2	20	5	15
Osterhaus, Hugo Wilson	Virginia	May 20, 1896	2	25	2	11	5	11
Riddle, William King	Tennessee	Sept. 5, 1896	2	25	0	0	2	25
Schoenfeld, John William	New York	July 6, 1896	2	25	0	0	2	25
Scranton, Edison Ernest	Ohio	May 20, 1896	2	25	0	0	2	25
Shea, William Henry	New York	May 20, 1896	2	25	2	7	5	2

[1] Sick leave from March 9 to May 28, 1898; transferred from next preceding class.

Naval Cadets of the Second Class—64 members—Continued.

Name.	State from which appointed.	Date of admission.	Sea service.					
			In practice ships.		During war with Spain.		Total.	
			Months.	Days.	Months.	Days.	Months.	Days.
Smith, Wilbert	Michigan	July 6, 1896	2	25	0	0	2	25
Snyder, Charles Philip	West Virginia	May 20, 1896	2	25	0	0	2	25
Spilman, John Armistead	Virginia	May 20, 1896	2	25	3	11	6	6
Steele, George Washington, jr	Indiana	June 3, 1896	2	25	0	0	2	25
Svarz, Emil Pravoslav	Texas	May 20, 1896	2	25	0	0	2	25
Tamura, Hiroaki	Empire of Japan	May 25, 1896	2	25	0	0	2	25
Timmons, John Wesley	Ohio	June 3, 1896	2	25	2	8	5	3
Tomb, William Victor	Arkansas	Sept. 5, 1896	2	25	2	24	5	19
Train, Charles Russell	New York	Sept. 5, 1896	2	25	2	10	5	5
Wade, Charles Tobias	New Jersey	Sept. 5, 1896	2	25	0	0	2	25
Wainwright, John Drayton	Delaware	Sept. 19, 1896	2	25	2	23	5	18
Winston, Hollis Taylor	North Carolina	Sept. 5, 1896	2	25	2	23	5	18
Woods, Stanley	Illinois	May 20, 1896	2	25	0	0	2	25
Wortman, Ward Kenneth	Montana	Sept. 5, 1896	2	25	2	25	5	20
Wright, Luke Edward, jr	Tennessee	Sept. 5, 1896	2	25	1	29	4	24
Wyman, Henry Lake	Illinois	Sept. 6, 1895	5	17	2	20	8	7

Naval Cadets of the Third Class—70 members.

Name.	State from which appointed.	Date of admission.	Sea service.					
			In practice ships.		During war with Spain.		Total.	
			Months.	Days.	Months.	Days.	Months.	Days.
Ackerson, James Lee	Michigan	May 20, 1897	0	0	0	0	0	0
Allen, Burrell Clinton	Kansas	Sept. 7, 1897	0	0	0	0	0	0
Allen, William Henry	South Carolina	May 20, 1897	0	0	0	0	0	0
Andrews, Adolphus	Texas	Sept. 7, 1897	0	0	0	0	0	0
Babcock, John Vincent	Iowa	Sept. 10, 1897	0	0	1	27	1	27
Bass, Ivan Ernest	Mississippi	May 20, 1897	0	0	0	0	0	0
Bertholf, Wallace	New Jersey	Sept. 22, 1897	0	0	0	0	0	0
Blair, George Fred	Michigan	Sept. 8, 1897	0	0	0	0	0	0
Brooks, Ernest Acton	Tennessee	Sept. 6, 1897	0	0	1	24	1	24
Bruff, Charles Lawrence	New York	May 20, 1897	0	0	1	25	1	25
Burwell, John Townsend	Virginia	May 20, 1897	0	0	2	11	2	11
Castle, Guy Wilkinson Stuart	Wisconsin	May 20, 1897	0	0	0	0	0	0
Colvocoresses, Harold	New Jersey	May 20, 1897	0	0	0	0	0	0
Conway, Clarence Arthur	Michigan	Sept. 10, 1897	0	0	0	0	0	0
Cook, Harold Earle	Massachusetts	May 20, 1897	0	0	3	3	3	3
Cook, Merlyn Grail	Kansas	Sept. 10, 1897	0	0	0	0	0	0
Cox, Lewis Smith, jr	New Jersey	Sept. 20, 1897	0	0	2	19	2	19
Downes, John, jr	At large	Sept. 8, 1897	0	0	2	12	2	12
Enochs, John Matt	Mississippi	Sept. 23, 1897	0	0	0	0	0	0
Fairfield, Arthur Philip	Maine	Sept. 8, 1897	0	0	2	27	2	27
Fisher, Charles Willis, jr	Maryland	Oct. 1, 1897	0	0	2	10	2	10
Fitzpatrick, John James	Louisiana	Sept. 8, 1897	0	0	2	12	2	12
Fogarty, William Bailey	Ohio	Sept. 20, 1897	0	0	0	0	0	0
Foote, Percy Wright	North Carolina	May 20, 1897	0	0	0	0	0	0
Fowler, Orie Walter	Iowa	May 20, 1897	0	0	0	0	0	0
Fremont, John Charles, jr	New York	May 20, 1897	0	0	3	3	3	3
Furer, Julius Augustus	Wisconsin	Sept. 10, 1897	0	0	0	0	0	0
Furse, John Houseal	Georgia	May 20, 1897	0	0	0	0	0	0
Galbraith, William Winton	Tennessee	May 20, 1897	0	0	2	11	2	11
Gay, Jesse Bishop	South Dakota	Sept. 9, 1897	0	0	0	0	0	0
Goodrich, Caspar	Connecticut	Sept. 7, 1897	0	0	3	3	3	3
Green, John Franklin	North Carolina	Sept. 7, 1897	0	0	0	0	0	0
Hamner, Edward Chambers, jr	Virginia	Sept. 9, 1897	0	0	0	0	0	0
Hannigan, John Joseph	Illinois	Sept. 9, 1897	0	0	2	19	2	19
Henry, Sidney Morgan	New York	Sept. 6, 1897	0	0	1	25	1	25
Hileman, Joseph Leonard	Virginia	Sept. 10, 1897	0	0	0	0	0	0
Howe, Alfred Graham	Indiana	May 20, 1897	0	0	2	12	2	12
Hutchins, Charles Thomas, jr	Pennsylvania	Sept. 20, 1897	0	0	2	27	2	27
Jackson, John Parker	New Jersey	Sept. 7, 1897	0	0	2	25	2	25
Keyes, Raymond Stedman	Ohio	Sept. 10, 1897	0	0	0	0	0	0
King, Ernest Joseph	Ohio	Sept. 6, 1897	0	0	2	12	2	12
Kittinger, Theodore Albert	Indiana	May 20, 1897	0	0	0	0	0	0
Kurtz, Thomas Richardson	Minnesota	Sept. 6, 1897	0	0	0	0	0	0
Long, Byron Andrew	California	Sept. 10, 1897	0	0	0	0	0	0
McBride, Lewis Bowen	Pennsylvania	Sept. 6, 1897	0	0	0	0	0	0
McCommon, Frank	Missouri	Sept. 21, 1897	0	0	0	0	0	0
McCrary, Frank Robert	Arkansas	Sept. 11, 1897	0	0	0	0	0	0
Manley, Rufus Sumner	Kansas	Sept. 7, 1897	0	0	2	0	2	0
Moore, Langdon	New York	Sept. 17, 1897	0	0	2	25	2	25

Naval Cadets of the Third Class—70 members—Continued.

Name.	State from which appointed.	Date of admission.	Sea service.					
			In practice ship.		During war with Spain.		Total.	
			Months.	Days.	Months.	Days.	Months.	Days.
Neal, George Franklin	Tennessee	May 20, 1897	0	0	0	0	0	0
Nightingale, Garrard Post	New York	May 20, 1897	0	0	0	0	0	0
Norris, William	Pennsylvania	Sept. 7, 1897	0	0	0	0	0	0
Oakley, Owen Horace	Nebraska	May 20, 1897	0	0	0	0	0	0
Oliver, Frederick Lansing	North Carolina	Sept. 8, 1897	0	0	2	10	2	10
Perry, Newman Kershaw, jr	South Carolina	Sept. 9, 1897	0	0	0	0	0	0
Pye, William Satterlee	Minnesota	May 20, 1897	0	0	0	0	0	0
Richardson, Holden Chester	Pennsylvania	Sept. 8, 1897	0	0	0	0	0	0
Rodgers, John	At large	Sept. 7, 1897	0	0	2	25	2	25
[1] Roosevelt, Henry Latrobe	New York	July 6, 1896	2	25	3	4	5	29
Simons, Manley Hale	Rhode Island	May 20, 1897	0	0	0	0	0	0
Spafford, Edward Elwell	Vermont	Sept. 9, 1897	0	0	0	0	0	0
Steinhagen, William Henry	Indiana	Sept. 6, 1897	0	0	1	17	1	17
Vernou, Walter Newhall	Michigan	Sept. 20, 1897	0	0	2	25	2	25
Walsh, John Henry	Washington	Sept. 10, 1897	0	0	0	0	0	0
Westervelt, George Conrad	Texas	May 20, 1897	0	0	0	0	0	0
Whitlock, Guy	Minnesota	May 20, 1897	0	0	0	0	0	0
Williams, Roger	New York	May 20, 1897	0	0	3	3	3	3
Wygant, Benyaurd Bourne	Florida	Sept. 20, 1897	0	0	2	17	2	17
Yates, Isaac Irving	New York	May 20, 1897	0	0	0	0	0	0
Zogbaum, Rufus Fairchild, jr	New York	May 20, 1897	0	0	2	14	2	14

[1] Sick leave from February 5 to May 28, 1898; transferred from next preceding class.

Naval Cadets of the Fourth Class—93 members.

Name.	State from which appointed.	Date of admission.	Age at date of admission.	
			Years.	Months.
Abbott, John Strong	Wisconsin	Sept. 10, 1898	16	2
Adams, Roe Reed	Illinois	Sept. 12, 1898	19	5
Alsop, Kelley Doyle	Mississippi	May 24, 1898	17	11
Ancrum, William	South Carolina	May 23, 1898	16	10
Anderson, Edward Clay	Pennsylvania	May 23, 1898	18	8
Apted, Herbert Milton	Massachusetts	Sept. 19, 1898	19	1
Arwine, John S, jr	Indiana	Sept. 22, 1898	18	9
Austin, James Maxwell	Alabama	Sept. 10, 1898	19	10
Baker, Don D	Ohio	May 20, 1898	18	10
Baldridge, Harry Alexander	Missouri	Sept. 13, 1898	18	6
Bean, Carlos	Texas	Sept. 12, 1898	17	7
Bingham, Donald Cameron	Alabama	Sept. 9, 1898	16	1
Blackburn, John Hail	Massachusetts	Sept. 29, 1898	17	11
Brooks, Leroy, jr	Ohio	Sept. 8, 1898	17	1
Brown, George Patton	California	Sept. 13, 1898	16	11
Brown, Wilson, jr	New Jersey	Sept. 23, 1898	16	5
Campbell, James Atkinson, jr	Pennsylvania	Sept. 8, 1898	17	5
Childs, Harold David	Vermont	Sept. 12, 1898	19	4
Claude, Abram	Maryland	Sept. 12, 1898	17	3
Conn, William Tipton, jr	Maryland	Sept. 9, 1898	17	6
Cooper, Oscar Fleet	North Carolina	May 26, 1898	19	4
Corning, Merritt Sherman	New York	Sept. 10, 1898	19	1
Craft, Ralph Payne	Missouri	Sept. 21, 1898	18	1
Darst, Gilford	West Virginia	Sept. 21, 1898	16	3
Davis, Roscoe Conklin	Kentucky	Sept. 22, 1898	19	11
Deering, George Alexander	New York	Sept. 10, 1898	17	8
Diman, Walter George	Massachusetts	Sept. 12, 1898	18	11
Dowling, Otto Carl	Massachusetts	Sept. 9, 1898	17	6
Early, Charles William	Virginia	Sept. 13, 1898	19	9
Enfer, Emile Paul	New York	May 21, 1898	16	5
Eslick, Fred Murphy	Tennessee	Sept. 8, 1898	19	2
Finney, Earl Peck	Wisconsin	Sept. 17, 1898	19	6
Fisher, Joseph Otto	Maine	May 21, 1898	16	2
Freyer, Frank Barrows	Georgia	May 23, 1898	19	5
Ghent, Daniel Throckmorton	Texas	May 23, 1898	17	7
Goldman, Mayer Leon	Louisiana	Sept. 7, 1898	19	2
Griswold, Ralph Mancill	Massachusetts	Sept. 9, 1898	17	1
Hall, Frank David	Illinois	May 23, 1898	17	4
Hart, Asa Ernest Lasher	New York	Sept. 22, 1898	19	8
Henderson, Robert	Massachusetts	May 21, 1898	19	7
Hepburn, Harry Marlin	Iowa	Sept. 22, 1898	17	0
Hickman, Christopher Jackson	Kentucky	Sept. 8, 1898	17	5
Horning, George Raymond	Pennsylvania	Sept. 21, 1898	19	0
Johnston, Richard Howard	Missouri	June 2, 1898	18	4
[1] Kerrick, Charles Sylvanus	California	Sept. 11, 1897	17	3
Kintner, Edwin Graham	Indiana	Sept. 12, 1898	17	4
Klyce, Horace Scudder	Arkansas	Sept. 7, 1898	18	10
Lacy, Lindsay Hensley	Texas	Sept. 12, 1898	16	6
Land, Emory Scott	Wyoming	Sept. 9, 1898	19	8
Lannon, James Patrick	Virginia	Sept. 12, 1898	19	11
Lawrason, George Carson	Louisiana	Sept. 9, 1898	18	9

[1] Sick leave from December 21, 1897, to September 30, 1898; transferred from next preceding class.

Naval Cadets of the Fourth Class—93 members—Continued.

Name.	State from which appointed.	Date of admission.	Age at date of admission.	
			Years.	Months.
Marquart, Edward John	Indiana	Sept. 7, 1898	18	5
Martin, Frank Charles	Illinois	May 21, 1898	19	2
Meyers, George Julian	Iowa	May 23, 1898	17	1
Morton, Harry Thomas	Missouri	Sept. 7, 1898	19	8
Moses, William Jacob	New York	June 3, 1898	16	9
Mott, Thomas Alexander	North Carolina	May 21, 1898	19	1
Murdock, James Paulding	New York	Sept. 10, 1898	18	0
Murphy, Daniel James	California	May 21, 1898	18	2
Nichols, Neil Ernest	Michigan	May 20, 1898	18	8
Nussbaum, Victor Michael	Indiana	May 24, 1898	16	2
[1] O'Reilly, Philip Maitland	Pennsylvania	May 24, 1898	18	7
O'Rourke, Maurice Wright	Oklahoma Territory	May 21, 1898	15	11
Osburn, Franklin Wayne	Oregon	Sept. 27, 1898	16	2
Ownby, George Sanders	Tennessee	Sept. 12, 1898	17	5
Ozburn, Thomas Lindorf	Illinois	May 21, 1898	19	2
Parker, Edward Bunner	New Hampshire	Sept. 9, 1898	19	5
Peterson, Andrew Aloysius	New York	Sept. 21, 1898	18	11
Porterfield, Louis Broughton	Alabama	Sept. 8, 1898	18	10
Poteet, Fred Helstead	Missouri	Oct. 17, 1898	19	2
Price, Clarence Hill	Georgia	Sept. 12, 1898	17	5
Pryor, William Lee	Missouri	Sept. 12, 1898	18	9
Puleston, William Dilworth	Florida	Sept. 7, 1898	17	0
Quinlan, William James	New York	Sept. 14, 1898	17	11
Read, Semmes	West Virginia	Oct. 3, 1898	17	11
Reed, James, jr	Ohio	Sept. 8, 1898	17	10
Richardson, James Otto	Texas	Sept. 21, 1898	20	0
Rowcliff, Gilbert Jonathan	Illinois	May 25, 1898	16	10
St. George, William Theodore	New York	May 21, 1898	19	6
Simmers, Clayton Miller	Pennsylvania	Sept. 12, 1898	19	4
Smith, William Walker	Kentucky	Sept. 8, 1898	16	6
Staton, Adolphus	North Carolina	Sept. 12, 1898	19	0
Sterling, Frank Ward	Illinois	Sept. 24, 1898	17	3
Symonds, Charles Fitch	New York	Sept. 9, 1898	18	10
Thompson, George Nicholas	Pennsylvania	Sept. 9, 1898	18	6
Townsend, Julius Curtis	Iowa	Sept. 8, 1898	17	6
Wainwright, Richard, jr	At large	Sept. 8, 1898	16	11
Wallace, Henry George Stewart	Colorado	Sept. 27, 1898	18	10
Wallace, Robert, jr	Kentucky	Sept. 12, 1898	16	9
Walthall, William Henderson	Missouri	Sept. 17, 1898	17	8
[2] Weaver, David Allen	Georgia	Sept. 11, 1897	17	11
Whitten, Francis Samuel	New Mexico	May 23, 1898	18	0
Woodruff, John Williams	Michigan	Sept. 8, 1898	19	11

[1] Sea service during the war with Spain, 2 months and 24 days.

[2] Sick leave from May 20 to May 25, 1898; transferred from next preceding class.

Summary of Cadets at the United States Naval Academy, October, 1898.

	Members.	
First class—		
Line Division	42	
Engineer Division	11	
		53
Second class		64
Third class		70
Fourth class		93
		280
Pursuing post-graduate course, naval architecture:		
Members of class appointed in 1893—		
W. G. DuBose, E. F. Eggert		2
Members of class appointed in 1894—		
Henry Williams, John Halligan, jr., William C. Watts, H. T. Wright, F. L. Pinney		5
Total		287

PURSUING POST-GRADUATE COURSE IN NAVAL ARCHITECTURE,

Ensign J. W. Powell.

RELATIVE STANDING OF NAVAL CADETS FOR 1897–'98.

Classes of the Naval Cadets, at the United States Naval Academy, at the close of the Academic Year 1897–'98; with the relative standing of the members in each class, as determined at the Annual Examination, April–May, 1898.

* Received 85 per cent of the multiple.
† Found deficient, allowed a reëxamination, passed, and continued with class.
¶ Retained in next lower class.
a Absent from examination.
e Selected for Engineer Division.
m Deficient; recommended for reëxamination; failed; resigned.
r Resigned.
s Sick.

Relative standing of the Naval Cadets of the First Class—

Order of annual merit.	Name.	State from which appointed	Date of admission.	Age at date of admission.	
				Years.	Months.
20	Abele, Clarence Arthur	Massachusetts	Sept. 6, 1894	17	10
22	Babcock, John Franklin	New York	Sept. 22, 1894	15	0
10	Boone, Charles	Ohio	Sept. 6, 1894	17	11
5	Briggs, Wilbur Gerheart	New York	Sept. 6, 1894	18	7
14	Briggs, Zeno Everett	Nebraska	Sept. 22, 1894	17	11
26	Brown, Morris Hamilton	Indiana	May 19, 1894	17	6
8	Cotten, Lyman Atkinson	North Carolina	Sept. 6, 1894	19	8
7	Cronin, William Pigott	Connecticut	Sept. 6, 1894	15	7
25	Evans, Franck Taylor	At large	Sept. 6, 1894	18	11
* 2	**Halligan, John, jr**	Massachusetts	Sept. 6, 1894	18	3
11	Hand, James Alexander, jr	South Dakota	Sept. 6, 1894	18	11
21	Hanrahan, David Carlisle	Wisconsin	May 19, 1894	18	9
18	Johnson, Thomas Lee	Kansas	May 19, 1894	19	1
16	McIntyre, Edward William	California	Sept. 6, 1894	17	6
12	Macy, Ulysses Samuel	Missouri	Sept. 6, 1894	17	8
6	Marble, Ralph Norris, jr	Minnesota	May 19, 1894	15	2
27	Nelson, Charles Preston	Massachusetts	May 19, 1894	17	3
24	Pettengill, George Tilford	Idaho	Sept. 22, 1894	16	10
15	Pinney, Frank Lucius	Connecticut	Sept. 6, 1894	19	9
28	Roper, Walter Gordon	Georgia	Sept. 22, 1894	18	11
* 3	**Smith, George Leonard**	New Hampshire	Sept. 6, 1894	18	0
23	Sweet, George Cook	New York	Sept. 22, 1894	17	3
9	Tardy, Walter Benjamin	Arkansas	May 19, 1894	18	11
19	Tarrant, William Theodore	Texas	Sept. 6, 1894	16	1
* 1	**Watts, William Carleton**	Pennsylvania	Sept. 22, 1894	15	8
* 4	**Williams, Henry**	Maryland	Sept. 6, 1894	17	0
17	Williams, Yancey Sullivan	South Carolina	Sept. 6, 1894	18	4
13	Woods, Edward	Massachusetts	May 19, 1894	18	6

Line Division—28 members—Annual Examination, April, 1898.

Order of merit in—											Number of demerits.	Sea service in practice ships.		Order of annual merit.
Seamanship, naval construction, and naval tactics.	Seamanship, practice cruise.	Ordnance and gunnery.	Navigation and compass deviation.	Navigation, practice cruise.	Least squares and applied mechanics.	Physics.	International law.	Physiology and hygiene.	Efficiency.	Conduct.		Months.	Days.	
21	27	22	16	22	21	17	18	23	22	8	28	8	10	20
17	21	18	25	25	17	21	27	21	13	24	106	8	10	22
7	6	13	6	17	19	7	23	28	7	20	49	8	10	10
3	15	4	10	1	10	6	7	11	8	3	14	8	8	5
10	17	15	13	7	7	15	13	12	18	14	42	8	10	14
23	26	24	24	16	25	26	19	14	24	28	140	11	3	26
14	12	7	9	15	9	9	4	20	6	5	19	8	10	8
1	3	14	7	2	19	12	14	10	5	4	17	8	10	7
27	21	26	22	19	27	25	26	18	25	22	57	8	10	25
2	2	3	3	5	3	2	1	4	1	2	11	8	10	*2
15	13	8	12	12	15	12	4	5	13	17	45	8	10	11
25	15	20	26	26	28	23	20	16	11	19	48	11	3	21
16	24	23	14	24	8	16	17	21	26	10	32	11	3	18
18	18	17	8	9	22	28	11	3	21	14	42	8	10	16
10	14	12	11	13	5	18	15	9	18	21	50	8	10	12
9	4	6	4	8	6	5	12	13	13	12	38	11	3	6
26	9	27	28	27	26	24	25	25	18	26	114	11	3	27
24	18	21	20	13	16	21	27	15	27	24	106	8	10	24
13	18	11	15	28	18	10	21	7	10	6	21	8	10	15
28	28	28	27	21	23	27	24	27	28	27	128	8	10	28
8	1	4	2	6	4	4	10	8	4	1	8	8	10	*3
20	25	25	23	23	24	12	22	24	13	23	83	8	10	23
6	6	9	18	19	13	11	2	5	2	16	44	11	3	9
22	23	15	18	10	13	20	6	16	22	18	47	8	10	19
4	8	2	1	4	1	1	7	1	2	7	25	5	15	*1
5	4	1	5	17	2	3	9	2	13	11	34	8	10	*4
18	9	19	17	2	11	19	16	26	12	8	28	8	8	17
12	11	9	20	10	11	7	3	18	9	13	39	11	3	13

Relative standing of the Naval Cadets of the First Class—

Order of annual merit.	Name.	State from which appointed.	Date of admission.	Age at date of admission.	
				Years.	Months.
9	Constien, Edward Theodore	Pennsylvania	May 19, 1894	18	6
3	Dinger, Henry Charles	Wisconsin	May 19, 1894	18	2
*1	**Elson, Herman Jacob**	Mississippi	May 19, 1894	18	4
8	Faller, Guy William	Wisconsin	May 19, 1894	16	1
11	Graham, John Sisson	Colorado	May 19, 1894	19	1
5	Mitchell, Alexander Neely	Ohio	Sept. 6, 1894	18	11
7	Schofield, John Anderson	Missouri	Sept. 6, 1894	18	6
4	Shane, Louis	Nebraska	Sept. 6, 1894	17	4
6	Sheffield, Fletcher Lamar	Georgia	Sept. 6, 1893	17	6
10	Wells, William Benefiel	Iowa	May 19, 1894	17	4
*2	**Wright, Henry Tutwiler**	Alabama	Sept. 6, 1894	19	8

Engineer Division—11 members—Annual Examination, April, 1898.

Sea service in practice ships.		Order of merit in—												
Months.	Days.	Naval construction.	Designing machinery.	Marine engines.	Boilers.	Experimental engineering.	Practice cruise.	Least squares and applied mechanics.	Physics.	Physiology and hygiene.	Efficiency.	Conduct.	Number of demerits.	Order of annual merit.
10	26	6	9	9	9	10	9	10	10	8	7	1	3	9
10	28	7	3	1	2	2	4	3	1	5	4	11	69	3
10	28	3	1	2	1	3	1	4	3	2	1	7	26	*1
10	26	5	8	10	6	9	10	7	6	9	8	9	28	8
10	26	10	11	11	11	11	7	11	11	4	5	5	22	11
8	3	4	4	6	5	7	3	6	7	7	3	4	17	5
8	3	8	10	5	7	5	8	9	7	6	9	7	26	7
8	5	2	2	4	4	4	11	5	5	3	10	10	33	4
8	18	9	6	7	8	6	5	2	9	10	6	1	3	6
11	3	11	7	8	10	8	6	8	4	11	11	6	25	10
8	5	1	5	3	3	1	2	1	2	1	2	3	4	*2

Relative standing of the Naval Cadets of the Second

Order of annual merit.	Name.	State from which appointed.	Date of admission.
5	Bailey, John Eliot	Michigan	May 20, 1895
6	Beckner, John Taliaferro	Kentucky	May 20, 1895
*3	**Bisset, Guy Aloysius**	Kentucky	Sept. 6, 1895
12	Bloch, Claude Charles	Kentucky	Sept. 6, 1895
47	Bowers, John Treadwell	New Jersey	Sept. 6, 1895
39	Branch, Frank Oak	Indiana	Sept. 6, 1895
28	Brinser, Harry Lerch	Pennsylvania	Sept. 6, 1895
*2	**Buchanan, Allen**	Indiana	Sept. 6, 1895
21	Clement, James Wilkinson Legare, jr	South Carolina	Sept. 27, 1895
23	Cole, Cyrus Willard	Ohio	Sept. 6, 1895
31	Combs, James Rockwell	Illinois	Sept. 6, 1895
40	Courtney, Charles Edward	New York	May 20, 1895
11	Dungan, Paul Baxter	Nebraska	Sept. 6, 1895
20	Evans, Herbert Heard	Mississippi	Sept. 6, 1895
*4	**Fenner, Edward Blaine**	New York	May 20, 1895
25	Fischer, Charles Hermann	Pennsylvania	Sept. 6, 1895
†	Forman, Charles William	Illinois	Sept. 6, 1895
41	Gilmer, James Blair	Virginia	May 19, 1894
8	Gleason, Henry Miller	Kansas	May 20, 1895
24	Greenslade, John Wills	Ohio	May 20, 1895
46	Hatch, Charles Byron, jr	Illinois	Sept. 6, 1895
44	Helm, Frank Pinckney, jr	Kentucky	May 20, 1895
36	Horne, Frederick Joseph	New York	May 20, 1895
†	Hunt, Walter Merrill	Maine	Sept. 6, 1395
¶8	Jeffers, William Nicholson	New York	Sept. 20, 1895
37	Johnson, Alfred Wilkinson	At large	May 20, 1895
17	Kalbfus, Edward C ifford	At large	May 20, 1895
14	Kimberly, Victor A shfield	Massachusetts	Sept. 6, 1895
18	Lackey, Henry Ellis	At large	May 20, 1895
45	Larimer, Edgar Brown	Kansas	Sept. 6, 1895
43	Lewis, John Earl	Minnesota	Sept. 6, 1895
50	Madison, Zachariah Harvey	Illinois	Sept. 6, 1894
30	Major, Samuel Ira Monger	Kentucky	Sept. 20, 1895
35	Mathews, James Edward	Illinois	May 20, 1895
26	Miller, William Siebel	Texas	Sept. 20, 1895
42	Morgan, Charles Elmer	West Virginia	Sept. 6, 1895
19	Morrison, Farmer	Arkansas	Sept. 6, 1895
48	Pope, Ralph Elton	Nebraska	May 20, 1895
16	Royall, Hilary Herbert	Alabama	May 20, 1895
13	Sadler, Everit Jay	Kansas	Sept. 20, 1895
33	Sayles, William Randall	Rhode Island	May 20, 1895
†	Shackford, Chauncey	New Jersey	Sept. 6, 1895
15	Shapley, Lloyd Stowell	Missouri	May 30, 1895
*1	**Sparrow, Herbert George**	Ohio	Sept. 6, 1895
22	Taussig, Joseph Knefler	At large	May 30, 1895
38	Thomas, Samuel Brown	At large	May 30, 1895

Class—54 members—Annual Examination, May, 1898.

Age at date of admission.		Order of merit in—										Number of demerits.	Order of annual merit.
Years.	Months.	Seamanship.	Astronomy.	Principles of mechanism and marine engines.	Calculus and mechanics.	Physics and chemistry.	French.	History.	Mechanical drawing.	Efficiency.	Conduct.		
17	10	12	8	5	4	4	17	8	26	12	22	58	5
16	8	51	9	15	1	6	23	12	49	29	16	37	6
18	1	7	3	2	2	3	9	7	9	38	11	32	*3
17	2	15	6	18	12	7	11	23	44	51	25	59	12
18	5	49	40	43	29	24	8	47	40	41	53	182	47
17	4	32	25	27	20	34	53	50	50	46	39	91	39
18	9	42	36	27	21	39	41	39	20	35	8	29	28
18	9	1	2	4	4	2	14	1	8	1	8	30	*2
17	1	9	25	25	22	45	9	6	42	12	22	58	21
19	3	26	46	17	18	42	29	44	3	27	35	78	23
19	1	19	36	10	52	17	30	31	2	49	49	137	31
17	11	39	30	51	29	42	35	14	29	33	35	77	40
18	2	20	16	8	10	8	36	28	10	21	44	121	11
15	5	34	36	14	34	12	19	10	47	43	22	57	20
18	9	5	4	6	7	5	12	4	5	8	6	27	*4
19	11	40	36	31	39	23	40	43	20	9	5	23	25
18	11	44	53	50	50	22	42	33	51	42	42	110	†
18	2	26	43	46	42	41	49	22	14	29	30	70	41
18	7	11	5	6	17	15	15	19	6	5	29	66	8
15	4	31	23	24	34	35	25	20	3	11	21	51	24
17	1	45	29	39	14	39	38	36	34	52	50	148	46
18	2	43	50	41	41	50	46	37	40	35	15	36	44
15	3	46	21	47	24	33	22	20	11	38	40	96	36
18	11	20	41	52	42	45	39	30	48	38	41	98	†
18	6	(a)	(a)	(a)	(a)	(a)	(a)	(a)	22	(a)	(a)	42	¶ s
18	6	20	49	36	34	42	7	26	45	15	28	64	37
17	6	6	11	27	16	20	18	3	22	12	25	59	17
17	10	18	16	9	7	15	5	34	11	23	47	134	14
18	11	6	19	11	45	35	1	44	16	4	11	32	18
19	1	24	51	44	50	51	34	41	25	25	19	48	45
17	2	16	47	23	27	35	48	34	28	25	47	133	43
17	8	50	52	31	44	35	43	31	33	53	52	173	50
18	0	36	23	37	47	27	15	9	34	18	17	42	30
19	4	37	31	44	25	30	25	52	30	37	27	60	35
18	9	26	31	18	29	21	4	15	27	27	43	119	26
18	7	34	45	34	25	24	23	27	38	47	46	128	42
19	7	8	15	15	32	11	20	29	53	15	37	83	19
19	4	53	48	47	33	52	50	47	31	49	33	72	48
18	9	48	20	33	6	14	25	39	31	29	18	43	16
16	4	26	13	13	13	9	13	25	22	43	30	69	13
17	5	20	28	39	39	48	47	16	46	10	6	27	33
18	5	37	41	53	53	53	52	53	51	18	1	6	†
19	6	4	18	12	18	19	43	41	53	23	3	19	15
18	1	2	1	1	3	1	2	2	18	6	2	13	*1
17	9	13	25	47	45	26	51	12	13	2	11	32	22
17	4	14	43	34	34	47	37	49	39	3	30	70	38

Relative standing of the Naval Cadets of the Second

Order of annual merit.	Name.	State from which appointed.	Date of admission.
34	Tomb, James Harvey	Missouri	Sept. 6, 1895
49	Vincent, Roe Willis	Pennsylvania	Sept. 6, 1895
32	Watson, Adolphus Eugene	At large	May 30, 1895
9	Weichert, Ernest Augustus	Connecticut	Sept. 6, 1895
7	White, Richard Drace	Missouri	May 20, 1895
10	Wood, Welborn Cicero	Georgia	Sept. 6, 1895
27	Woodward, Clark Howell	Georgia	Sept. 6, 1895
29	Yates, Alexander Fred Hammond	Maine	May 20, 1895

Class—54 members—Annual Examination, May, 1898.

Age at date of admission.		Order of merit in—											
Years.	Months.	Seamanship.	Astronomy.	Principles of mechanism and marine engines.	Calculus and mechanics.	Physics and chemistry.	French.	History.	Mechanical drawing.	Efficiency.	Conduct.	Number of demerits.	Order of annual merit.
19	0	30	12	37	27	32	30	38	36	33	38	86	34
18	4	52	34	41	34	48	43	51	15	47	51	153	49
16	9	25	22	21	48	30	30	46	1	29	34	75	32
17	11	32	13	21	11	18	5	5	18	7	3	19	9
18	1	3	7	3	9	9	3	17	17	21	45	124	7
19	8	10	10	20	15	13	20	11	43	18	14	33	10
18	6	47	33	25	48	28	25	18	6	15	8	29	27
16	4	41	34	27	23	28	30	23	36	45	20	50	29

Relative standing of the Naval Cadets of the Third

Order of annual merit.	Name.	State from which appointed.	Date of admission.
52	Abernathy, Robert Andrew	Tennessee	Sept. 5, 1896
47	Arnold, Clarence Lamont	Indiana	Sept. 5, 1896
54	Barthalow, Benjamin Grady	Ohio	Sept. 5, 1896
31	Berrien, Frank Dunn	Iowa	Sept. 5, 1896
38	Berry, Robert Lawrence	Kentucky	May 20, 1896
D 8	Boardman, William Henry	Massachusetts	Sept. 5, 1396
19	Bricker, William Franklin	Pennsylvania	Sept. 19, 1896
*1	**Bryant, Samuel Wood**	Pennsylvania	Sept. 5, 1896
42	Bulwer, Bayard Taylor	Nevada	Sept. 5, 1896
60	Caffery, John Murphy	Louisiana	Sept. 5, 1896
40	Cage, Harry Kimball	Texas	May 20, 1896
33	Case, William Stanhope	Illinois	Sept. 6, 1895
35	Church, John Gaylord	Ohio	May 20, 1896
46	Cocke, Herbert Claiborne	Virginia	May 20, 1896
45	Comfort, James Hall	Missouri	May 20, 1896
r	Cresap, Edward Otho	Florida	May 20, 1896
59	Crittenden, Kirby Barnes	Missouri	Sept. 5, 1896
*5	**Defrees, Joseph Rollie**	Illinois	May 20, 1896
48	Dodd, Edwin Horace	Illinois	Sept. 5, 1896
26	Doyle, Stafford Henry Rahall	South Carolina	May 20, 1896
53	Ellis, Hayne	Georgia	Sept. 5, 1896
r	Enbody, Josiah Waterhouse	Pennsylvania	Sept. 5, 1896
*4	**Ferguson, William Burden, jr**	North Carolina	May 20, 1896
32	Foley, Paul	New York	Sept. 5, 1896
23	Freeman, Charles Seymour	Pennsylvania	Sept. 5, 1896
14	Gannon, Sinclair	Texas	June 3, 1896
37	Gardiner, Carlos Alfonso	Illinois	May 20, 1896
21	Hellweg, Julius Frederick	Maryland	Sept. 5, 1896
56	Howard, Abram Claude	Illinois	Sept. 5, 1896
50	Huff, Charles Peabody	Missouri	Sept. 5, 1896
d 58	Hulick, Clive Kelsey	Ohio	Sept. 5, 1896
13	Hyland, John Joseph	Massachusetts	Sept. 19, 1896
6	Jackson, Edward Sharpless, jr	Pennsylvania	May 22, 1896
39	Johnston, Huntington	Oregon	Sept. 19, 1896
9	Kear, Carleton Romig	Ohio	May 20, 1896
22	Keating, Arthur Barnes	Maryland	Sept. 19, 1896
7	Kress, James Chatham	Pennsylvania	May 20, 1897
41	Landenberger, George Bertram	Pennsylvania	May 20, 1896
62	Landram, Clarence Elmer	Kentucky	Sept. 5, 1896
*3	**McEntee, William**	Minnesota	May 20, 1896
m	Mann, John Ferris	New York	Sept. 5, 1896
*2	**Mannix, Daniel Pratt**	At large	May 20, 1897
43	Menner, Robert Tryon	Pennsylvania	Sept. 5, 1896

Class—70 members—Annual Examination, May, 1898.

Age at date of admission.		Order of merit in—							Number of demerits.	Order of annual merit.
Years.	Months.	Trigonometry, analytical geometry, and descriptive geometry.	Physics and chemistry.	English and law.	French and Spanish.	Mechanical drawing.	Efficiency.	Conduct.		
16	1	56	51	20	44	68	67	34	81	52
18	0	32	46	56	60	39	57	40	97	47
18	6	49	55	57	59	51	53	46	111	54
19	0	27	30	40	26	18	10	49	129	31
15	9	30	28	36	36	34	19	53	152	38
19	10	7	14	29	18	10	7	40	97	*D*8
17	8	26	26	35	21	16	7	14	47	19
19	3	1	5	11	2	2	3	31	80	*1
19	9	42	39	42	40	44	26	34	82	42
18	11	66	65	62	65	64	51	18	51	60
16	8	39	33	44	45	41	26	29	78	40
18	0	27	27	63	34	25	59	22	65	33
17	1	53	22	10	57	33	37	26	72	35
18	4	45	58	54	53	53	12	16	48	46
19	6	32	48	39	53	61	53	9	42	45
18	6	12				4				*r*
17	5	59	55	36	31	69	62	62	197	59
19	11	3	12	12	32	6	26	2	27	*5
17	0	49	53	28	20	43	51	58	187	48
20	0	54	35	17	13	47	12	6	37	26
19	0	45	31	50	55	54	41	51	134	53
19	9	69	57	50	42	22	37	22	65	*r*
18	0	2	3	1	3	32	18	45	110	*4
18	3	20	66	29	8	27	21	54	156	32
17	9	36	21	3	36	62	15	6	37	23
19	2	31	40	19	22	8	9	4	34	14
16	7	38	40	6	15	44	53	60	192	37
17	5	37	59	22	25	15	19	16	48	21
16	5	59	60	59	30	67	64	39	95	56
19	4	32	20	40	40	57	66	61	195	50
17	1	56	67	66	60	52	44	47	113	*d*58
18	5	10	46	23	6	27	47	14	47	13
18	3	13	9	5	1	29	21	12	43	6
18	9	49	29	48	27	47	29	27	74	39
16	2	4	12	24	16	36	41	8	38	9
17	2	39	19	15	13	39	29	29	79	22
20	0	4	9	20	28	5	5	31	80	7
17	1	35	40	36	49	18	41	52	137	41
16	7	62	40	61	47	57	68	67	240	62
19	0	6	1	9	4	8	15	27	73	*3
19	4	67	48	31	28	62	58	40	97	*m*
18	9	8	7	2	4	14	1	1	16	*2
19	11	16	22	63	51	56	59	37	92	43

D Accidentally shot at Cape San Juan, Puerto Rico; died August 10, 1898.
d Died at his home, June 11, 1898.

Relative standing of the Naval Cadets of the Third Class—

Order of annual merit.	Name.	State from which appointed.	Date of admission.
15	Mitchell, Willis Gemmill	Pennsylvania	Sept. 5, 1896
28	Morris, Robert	Utah	Sept. 5, 1896
10	Naile, Frederick Raymonde	Pennsylvania	Sept. 5, 1896
60	Noa, Loveman	Tennessee	Sept. 5, 1896
64	Osterhaus, Hugo Wilson	Virginia	May 20, 1896
28	Riddle, William King	Tennessee	Sept. 5, 1896
¶ s	Roosevelt, Henry Latrobe	New York	July 6, 1896
55	Schoenfeld, John William	New York	July 6, 1896
44	Scranton, Edison Ernest	Ohio	May 20, 1896
63	Shea, William Henry	New York	May 20, 1896
34	Smith, Wilbert	Michigan	July 6, 1896
12	Snyder, Charles Philip	West Virginia	May 20, 1896
11	Spilman, John Armistead	Virginia	May 20, 1896
25	Steele, George Washington, jr	Indiana	June 3, 1896
36	Svarz, Emil Pravoslav	Texas	May 20, 1896
65	Tamura, Hiroaki	Empire of Japan	May 25, 1896
27	Timmons, John Wesley	Ohio	June 3, 1896
49	Tomb, William Victor	Arkansas	Sept. 5, 1896
57	Train, Charles Russell	New York	Sept. 5, 1896
16	Wade, Charles Tobias	New Jersey	Sept. 5, 1896
18	Wainwright, John Drayton	Delaware	Sept. 19, 1896
20	Winston, Hollis Taylor	North Carolina	Sept. 5, 1896
r	Wood, Robert Thompson	New York	Sept. 5, 1896
30	Woods, Stanley	Illinois	May 20, 1896
24	Wortman, Ward Kenneth	Montana	Sept. 5, 1896
51	Wright, Luke Edward, jr	Tennessee	Sept. 5, 1896
17	Wyman, Henry Lake	Illinois	Sept. 6, 1895

0 members—Annual Examination, May, 1898—Continued.

Age at date of admission.		Order of merit in—							Number of demerits.	Order of annual merit.
Years.	Months.	Trigonometry, analytical geometry, and descriptive geometry.	Physics and chemistry.	English and law.	French and Spanish.	Mechanical drawing.	Efficiency.	Conduct.		
18	11	24	4	14	52	21	6	9	41	15
17	9	18	35	49	47	18	59	25	66	28
16	2	10	14	4	7	29	44	37	92	10
17	11	55	34	46	50	55	49	68	213	60
16	6	65	62	67	67	49	47	57	182	64
19	8	17	40	27	8	29	29	58	187	28
16	8	(*a*)	(*a*)	(*a*)	(*a*)	(*a*)	(*a*)	(*a*)	115	¶ *s*
19	11	42	51	42	65	23	29	63	200	55
19	3	48	53	33	62	35	65	3	32	44
18	9	59	63	58	64	60	36	63	200	63
19	8	27	17	17	34	57	40	48	119	34
16	10	15	11	16	10	23	12	12	43	12
18	1	9	6	7	11	37	4	43	98	11
16	11	64	31	33	12	16	21	9	42	25
19	1	20	35	53	56	44	35	21	64	36
17	5	44	68	68	----------	3	29	4	34	65
17	10	39	25	50	22	26	2	31	80	27
18	11	62	61	44	46	41	29	22	65	49
16	11	56	64	65	58	50	15	55	160	57
16	11	19	18	8	39	13	37	36	84	16
18	2	20	45	32	24	11	11	19	59	18
18	10	20	22	25	36	6	49	50	131	20
17	4	68	48	54	43	65	63	56	179	*r*
18	6	24	1	60	63	1	21	65	202	30
16	7	14	8	46	32	37	53	43	98	24
19	3	49	38	12	17	66	44	66	217	51
16	9	47	16	25	19	11	21	19	58	17

Relative standing of the Naval Cadets of the Fourth

Order of annual merit.	Name.	State from which appointed.	Date of admission
*14	**Ackerson, James Lee**	Michigan	May 20, 1897
35	Allen, Burrell Clinton	Kansas	Sept. 7, 1897
38	Allen, William Henry	South Carolina	May 20, 1897
25	Andrews, Adolphus	Texas	Sept. 7, 1897
69	Babcock, John Vincent	Iowa	Sept. 10, 1897
55	Bass, Ivan Ernest	Mississippi	May 20, 1897
50	Bertholf, Wallace	New Jersey	Sept. 22, 1897
48	Blair, George Fred	Michigan	Sept. 8, 1897
20	Brooks, Ernest Acton	Tennessee	Sept. 6, 1897
r	Browne, Claude	Alabama	Sept. 11, 1897
39	Bruff, Charles Lawrence	New York	May 20, 1897
*6	**Burwell, John Townsend**	Virginia	May 20, 1897
52	Castle, Guy Wilkinson Stuart	Wisconsin	May 20, 1897
70	Colvocoresses, Harold	New Jersey	May 20, 1897
*8	**Conway, Clarence Arthur**	Michigan	Sept. 10, 1897
40	Cook, Harold Earle	Massachusetts	May 20, 1897
44	Cook, Merlyn Grail	Kansas	Sept. 10, 1897
*10	**Cox, Lewis Smith, jr**	New Jersey	Sept. 20, 1897
56	Downes, John, jr	At large	Sept. 8, 1897
27	Enochs, John Matt	Mississippi	Sept. 23, 1898
29	Fairfield, Arthur Philip	Maine	Sept. 8, 1897
*5	**Fisher, Charles Willis, jr**	Maryland	Oct. 1, 1897
56	Fitzpatrick, John James	Louisiana	Sept. 8, 1897
23	Fogarty, William Bailey	Ohio	Sept. 20, 1897
22	Foote, Percy Wright	North Carolina	May 20, 1897
*13	**Fowler, Orie Walter**	Iowa	May 20, 1897
28	Fremont, John Charles, jr	New York	May 20, 1897
*11	**Furer, Julius Augustus**	Wisconsin	Sept. 10, 1897
31	Furse, John Houseal	Georgia	May 20, 1897
58	Galbraith, William Winton	Tennessee	May 20, 1897
53	Gay, Jesse Bishop	South Dakota	Sept. 9, 1897
32	Goodrich, Caspar	Connecticut	Sept. 7, 1897
33	Green, John Franklin	North Carolina	Sept. 7, 1887
36	Hamner, Edward Chambers, jr	Virginia	Sept. 9, 1897
47	Hannigan, John Joseph	Illinois	Sept. 9, 1897
*7	**Henry, Sidney Morgan**	New York	Sept. 6, 1897
59	Hileman, Joseph Leonard	Virginia	Sept. 10, 1897
*1	**Howe, Alfred Graham**	Indiana	May 20, 1897
24	Hutchins, Charles Thomas, jr	Pennsylvania	Sept. 20, 1897
*12	**Jackson, John Parker**	New Jersey	Sept. 7, 1897
¶ s	Kerrick, Charles Sylvanus	California	Sept. 11, 1897
17	Keyes, Raymond Stedman	Ohio	Sept. 10, 1897
*2	**King, Ernest Joseph**	Ohio	Sept. 6, 1897
68	Kittinger, Theodore Albert	Indiana	May 20, 1897
*9	**Kurtz, Thomas Richardson**	Minnesota	Sept. 6, 1897

Class—75 members—Annual Examination May, 1898.

Age at date of admission.		Order of merit in—						
Years.	Months.	Algebra and geometry.	English and history.	French and Spanish.	Efficiency.	Conduct.	Number of demerits.	Order of annual merit.
15	9	1	19	41	18	28	56	*14
16	0	50	22	35	34	7	31	35
18	10	51	43	17	39	48	84	38
17	11	8	42	39	26	14	42	25
17	1	69	70	71	69	64	127	69
19	9	39	35	63	50	65	138	55
16	8	24	63	44	64	32	61	50
17	1	27	61	25	32	67	146	48
15	4	21	16	25	34	28	56	20
18	6	72	54	53	70	70	164	*r*
16	9	39	31	34	16	53	92	39
17	10	6	12	8	4	8	37	*6
17	3	32	53	57	26	57	106	52
16	8	69	61	67	23	72	210	70
16	6	4	10	19	50	9	38	*8
17	1	46	32	51	13	9	38	40
15	4	37	26	46	73	55	101	44
17	6	22	12	5	18	34	65	*10
17	9	37	58	49	12	69	154	56
19	5	29	28	33	58	17	45	27
19	10	36	30	21	16	57	107	29
16	10	5	10	2	46	35	67	*5
17	7	56	65	47	44	9	39	56
16	8	14	33	29	54	41	75	23
17	9	20	34	13	18	60	111	22
18	10	23	9	16	1	9	38	*13
17	2	45	44	10	5	52	90	28
16	10	14	7	19	34	17	44	*11
17	1	19	24	49	60	37	68	31
19	3	56	56	59	30	14	42	58
16	6	62	35	41	72	59	108	53
16	4	31	39	9	39	71	187	32
18	11	48	25	23	60	48	85	33
17	2	6	48	44	64	45	82	36
19	9	67	23	53	39	14	42	47
18	9	12	4	13	39	4	22	*7
18	11	62	51	64	55	25	53	59
18	11	10	3	5	8	1	8	*1
17	2	47	49	3	64	40	72	24
19	3	33	12	1	46	45	82	*12
17	3	(*a*)	(*a*)	(*a*)	(*a*)	(*a*)	4	¶ *s*
19	3	26	5	22	26	17	45	17
18	9	12	2	3	30	13	41	*2
18	8	58	71	69	58	63	121	68
15	10	16	5	12	46	25	52	*9

Relative standing of the Naval Cadets of the Fourth Class—

Order of annual merit.	Name.	State from which appointed.	Date of admission.
r	Lloyd, Howard Merriam	Illinois	Sept. 10, 1897
*4	**Long, Byron Andrew**	California	Sept. 10, 1897
*16	**McBride, Lewis Bowen**	Pennsylvania	Sept. 6, 1897
43	McCommon, Frank	Missouri	Sept. 21, 1897
63	McCrary, Frank Robert	Arkansas	Sept. 11, 1897
30	Manley, Rufus Sumner	Kansas	Sept. 7, 1897
66	Moore, Langdon	New York	Sept. 17, 1897
60	Neal, George Franklin	Tennessee	May 20, 1897
62	Nightingale, Garrard Post	New York	May 20, 1897
21	Norris, William	Pennsylvania	Sept. 7, 1897
65	Oakley, Owen Horace	Nebraska	May 20, 1897
46	Oliver, Frederick Lansing	North Carolina	Sept. 8, 1897
61	Perry, Newman Kershaw, jr	South Carolina	Sept. 9, 1897
26	Pye, William Satterlee	Minnesota	May 20, 1897
45	Richardson, Holden Chester	Pennsylvania	Sept. 8, 1897
m	Robertson, William Malcolm	Mississippi	May 20, 1897
67	Rodgers, John	At large	Sept. 7, 1897
41	Simons, Manley Hale	Rhode Island	May 20, 1897
51	Spafford, Edward Elwell	Vermont	Sept. 9, 1897
*3	**Steinhagen, William Henry**	Indiana	Sept. 6, 1897
37	Vernon, Walter Newhall	Michigan	Sept. 20, 1897
41	Walsh, John Henry	Washington	Sept. 10, 1897
¶ *s*	Weaver, David Allen	Georgia	Sept. 11, 1897
18	Westervelt, George Conrad	Texas	May 20, 1897
*d*49	Wheeler, Thomas Harrison	Alabama	May 20, 1897
54	Whitlock, Guy	Minnesota	May 20, 1897
34	Williams, Roger	New York	May 20, 1897
*15	**Wygant, Benyaurd Bourne**	Florida	Sept. 20, 1897
19	Yates, Isaac Irving	New York	May 20, 1897
64	Zogbaum, Rufus Fairchild, jr	New York	May 20, 1897

d Drowned near Camp Montauk, September 7, 1898.

75 members—Annual Examination, May 1898—Continued.

Age at date of admission.		Order of merit in—					Number of demerits.	Order of annual merit.
Years.	Months.	Algebra and geometry.	English and history.	French and Spanish.	Efficiency.	Conduct.		
17	6	73	72	68	60	61	112	*r*
17	4	2	8	11	18	37	69	*4
16	11	2	20	25	44	56	103	*16
19	3	43	39	41	50	32	60	43
17	11	58	65	69	64	22	48	63
18	11	43	26	30	18	35	67	30
18	8	54	63	73	32	45	83	66
18	0	62	55	60	13	43	76	60
16	1	49	59	60	25	62	117	62
17	8	18	15	39	60	20	46	21
18	9	65	65	72	2	39	71	65
18	3	39	44	56	39	22	49	46
16	9	58	57	65	46	30	58	61
16	11	24	41	25	5	30	59	26
18	9	27	46	53	34	44	81	45
16	3	71	73	65	55	73	251	*m*
16	7	68	69	60	34	66	142	67
18	0	39	35	37	23	50	86	41
19	5	51	49	38	55	25	53	51
17	11	8	1	13	2	2	11	*3
19	7	35	47	31	5	41	75	37
17	9	34	28	47	71	53	93	41
17	11	(*a*)	(*a*)	(*a*)	(*a*)	(*a*)	42	¶ *s*
17	4	17	18	24	13	22	49	18
16	2	61	59	18	50	50	86	*d* 49
18	0	54	52	58	26	5	26	54
17	6	53	35	32	8	3	13	34
16	8	29	20	5	64	20	46	*15
16	1	10	17	36	8	5	26	19
17	11	66	68	51	8	68	152	64

APPOINTMENTS, RESIGNATIONS, AND DEATHS.

OCTOBER 1, 1897, TO OCTOBER 4, 1898.

Appointed Ensigns May 6, 1898.

Naval Cadet Holden, Jonas Hannibal	Class of 1896
Naval Cadet Craven, Thomas Tingey	Class of 1896
Naval Cadet Poor, Charles Longstreet	Class of 1896
Naval Cadet Earl, Ralph	Class of 1896
Naval Cadet Kalbach, Andrew Edwin	Class of 1896
Naval Cadet Walker, Ralph Eric	Class of 1896
Naval Cadet Wurtsbaugh, Daniel Wilbert	Class of 1896
Naval Cadet Wetengel, Ivan Cyrus	Class of 1896
Naval Cadet Tozer, Charles Maxson	Class of 1896
Naval Cadet Cluverius, Wat Tyler, jr	Class of 1896
Naval Cadet Wood, Duncan Mahon	Class of 1896
Naval Cadet Palmer, Leigh Carlyle	Class of 1896
Naval Cadet Kearney, Thomas Albert	Class of 1896
Naval Cadet MacArthur, Arthur	Class of 1896
Naval Cadet Ridgely, Frank Eugene	Class of 1896
Naval Cadet Knox, Dudley Wright	Class of 1896
Naval Cadet Gilpin, Charles Edward	Class of 1896
Naval Cadet Ellis, Mark Saint Clair	Class of 1896
Naval Cadet McCauley, Edward, jr	Class of 1896
Naval Cadet Jessop, Earl Percy	Class of 1896
Naval Cadet Roys, John Holley	Class of 1896
Naval Cadet Mustin, Henry Croskey	Class of 1896
Naval Cadet Curtin, Roland Irvin	Class of 1896

Appointed Ensign June 20, 1898.

Naval Cadet Powell, Joseph Wright	Class of 1897

Appointed Assistant Engineers May 6, 1898.

Naval Cadet Leiper, Charles Lewis	Class of 1896
Naval Cadet Lincoln, Gatewood Sanders	Class of 1896
Naval Cadet Fitzgerald, Edward Thomas	Class of 1896
Naval Cadet Bisset, Henry Overstreet	Class of 1896
Naval Cadet Marshall, Albert Ware	Class of 1896
Naval Cadet Burt, Charles Perry	Class of 1896
Naval Cadet Castleman, Kenneth Galleher	Class of 1896
Naval Cadet Littlefield, William Lord	Class of 1896
Naval Cadet Washington, Pope	Class of 1896
Naval Cadet Rice, George Benjamin	Class of 1896
Naval Cadet Henry, James Buchanan, jr	Class of 1896
Naval Cadet Crenshaw, Arthur	Class of 1896

Appointed Assistant Naval Constructor April 21, 1898.

Naval Cadet Robinson, Richard Hallett ..... Class of 1896

Appointed Second Lieutenant United States Marine Corps May 6, 1898.

Naval Cadet Bronson, Amon, jr ..... Class of 1896

Resigned.

Naval Cadet James, John F., third class	Nov. 13, 1897
Naval Cadet Rhea, Robert Y., fourth class	Dec. 9, 1897
Naval Cadet Rich, Albert T., fourth class	Jan. 15, 1898
Naval Cadet Alsop, Kelley D., fourth class	Jan. 15, 1898
Naval Cadet Brooks, Leroy, jr., fourth class	Jan. 15, 1898
Naval Cadet Lindsay, Joseph S., fourth class	Jan. 15, 1898
Naval Cadet Woodson, Pickens E., fourth class	Jan. 20, 1898
Naval Cadet West, Arthur S., second class	Jan. 27, 1898
Naval Cadet Bowne, William R., fourth class	Feb. 2, 1898
Naval Cadet Cooper, Oscar F., fourth class	Feb. 2, 1898
Naval Cadet Gillmore, John D., fourth class	Feb. 5, 1898
Naval Cadet Nauman, Arthur L., fourth class	Feb. 7, 1898
Naval Cadet Tone, Bernard L., fourth class	Feb. 7, 1898
Naval Cadet Lawrason, George C., fourth class	Feb. 9, 1898
Naval Cadet Miles, Harold B., fourth class	Feb. 9, 1898
Naval Cadet Whitney, Edward L., fourth class	Feb. 9, 1898
Naval Cadet Brown, George P., fourth class	Feb. 9, 1898
Naval Cadet Price, Samuel R., fourth class	Feb. 9, 1898
Naval Cadet Hastings, Russell, fourth class	Feb. 9, 1898
Naval Cadet Cleveland, Thomas J., third class	May 7, 1898
Naval Cadet Green, Marshall B., fourth class	May 7, 1898
Naval Cadet Cresap, Edward O., third class	May 17, 1898
Naval Cadet Lloyd, Howard M., fourth class	June 1, 1898
Naval Cadet Browne, Claude, fourth class	June 1, 1898
Naval Cadet Enbody, Josiah W., third class	June 1, 1898
Naval Cadet Wood, Robert T., third class	June 1, 1898
Naval Cadet Mann, John F., third class	Oct. 4, 1898
Naval Cadet Robertson, William M., fourth class	Oct. 4, 1898

Died.

Naval Cadet Hulick, Clive K., second class	June 11, 1898
Naval Cadet Boardman, William H., second class	Aug. 10, 1898
Naval Cadet Wheeler, Thomas H., third class	Sept. 7, 1898

MERIT ROLLS FOR 1897–'98.

Merit rolls, made out annually for each class, show the proficiency of the cadets in each branch of study. The numbers given in the table, page —, showing the relative weight of the different branches, are used as coëfficients; the final mark in each branch (on a scale of 4) being multiplied by the number assigned to that branch. The sum of the products, after adding the multiple for discipline, is the final mark of the cadet for the year.

In the case of cadets that take an advanced course in any branch, the final mark in that branch is determined by adding to the final mark received in the required course one-fifth of the amount by which the final mark in the advanced course exceeds 2.50.

In the graduating merit roll, the final standing for the course is determined by the sum of the yearly marks.

"Cadets who attain 85 per cent of the multiple in any year shall be distinguished by a star affixed to their names on the merit rolls." (Regulations United States Naval Academy, par. 191.)

The diplomas of cadets whose final marks on the graduating merit roll are not less than 85 per cent of the maximum read, "passed with distinction;" those whose final marks are between 74 per cent and 85 per cent of the maximum read, "passed with credit;" and those whose final marks are between 62½ per cent and 74 per cent of the maximum read, "passed."

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* Received 85 per cent of the multiple.
† Found deficient, allowed a reëxamination, passed, and continued with class.
‡ Retained in next lower class.
a Absent from examination.
e Selected for Engineer Division.
m Deficient; recommended for reëxamination; failed; resigned.
r Resigned.
s Sick.

8173——4

Merit roll of the Graduating Class of Naval Cadets—Line Division—25 members—May, 1898.

On account of the war with Spain, the class of Naval Cadets appointed in 1892 did not return to the Naval Academy for final examination.

The members of the Line Division of that class were commissioned according to their standing at the completion of the four years' course, as follows:

Order of general merit for four years.	Name.	Assignment.
1	Richard H. Robinson	Assistant naval constructor.
2	Jonas H. Holden	Ensign.
3	Thomas T. Craven	Ensign.
4	Charles L. Poor	Ensign.
5	Ralph Earle	Ensign.
6	Andrew E. Kalbach	Ensign.
7	Ralph E. Walker	Ensign.
8	Daniel W. Wurtsbaugh	Ensign.
9	Ivan C. Wettengel	Ensign.
10	Charles M. Tozer	Ensign.
11	Wat T. Cluverius, jr	Ensign.
12	Duncan M. Wood	Ensign.
13	Leigh C. Palmer	Ensign.
14	Thomas A. Kearney	Ensign.
15	Arthur MacArthur, jr	Ensign.
16	Frank E. Ridgely	Ensign.
17	Dudley W. Knox	Ensign.
18	Charles E. Gilpin	Ensign.
19	Mark St. C. Ellis	Ensign.
20	Edward McCauley, jr	Ensign.
21	Earl P. Jessop	Ensign.
22	John H. Roys	Ensign.
23	Henry C. Mustin	Ensign.
24	Roland I. Curtin	Ensign.
25	Amon Bronson, jr	Second lieutenant, U. S. M. C.

Merit roll of the Graduating Class of Naval Cadets—Engineer Division—12 members—May, 1898.

On account of the war with Spain, the class of Naval Cadets appointed in 1892 did not return to the Naval Academy for final examination.

The members of the Engineer Division of that class were commissioned according to their standing at the completion of the four years' course, as follows:

Order of general merit for four years.	Name.	Assignment.
1	Charles L. Leiper	Assistant engineer.
2	Gatewood S. Lincoln	Assistant engineer.
3	Edward T. Fitzgerald	Assistant engineer.
4	Henry O. Bisset	Assistant engineer.
5	Albert W. Marshall	Assistant engineer.
6	Charles P. Burt	Assistant engineer.
7	Kenneth G. Castleman	Assistant engineer.
8	William L. Littlefield	Assistant engineer.
9	Pope Washington	Assistant engineer.
10	George B. Rice	Assistant engineer.
11	James B. Henry, jr	Assistant engineer.
12	Arthur Crenshaw	Assistant engineer.

Merit roll for the four years ending June, 1897, of the Naval Cadets of the class appointed in 1893, now performing required service afloat—Line Division—36 members.

Order of general merit for four years.	Name.	Aggregate for first year.	Aggregate for second year.	Aggregate for third year.	Aggregate for fourth year.	General aggregate for four years.
	Maxima	76	152	228	304	760
1	William G. Du Bose[1]	70.85	139.00	202.97	277.94	690.76
2	Ernest F. Eggert[1]	62.22	134.27	209.50	275.99	681.98
3	Harry E. Yarnell	64.87	131.28	194.27	265.32	655.74
4	Harlan P. Perrill	64.81	126.65	194.56	263.23	649.25
5	Arthur J. Hepburn	65.30	121.86	192.94	263.19	643.29
6	David E. Theleen	61.46	126.51	189.14	251.48	628.59
7	Alfred W. Pressey	62.52	125.49	188.75	246.87	623.63
8	Needham L. Jones	63.32	127.66	180.19	251.01	622.18
9	William H. Reynolds	59.89	121.08	179.69	251.79	612.45
10	Luthur M. Overstreet	58.56	124.63	181.41	247.73	612.33
11	Thomas C. Hart	56.00	115.73	184.17	254.33	610.23
12	Orin G. Murfin	59.48	120.13	180.85	249.20	609.66
13	Leonard R. Sargent	62.41	118.27	180.88	248.05	609.61
14	Cyrus R. Miller	62.38	122.33	184.25	236.94	605.90
15	Gilbert Chase	59.76	125.61	179.61	230.77	595.75
16	William R. White	59.47	119.76	187.54	226.22	592.99
17	Joseph W. Graeme	61.14	120.99	171.45	230.77	584.35
18	Victor S. Houston	62.60	122.96	170.85	227.57	583.98
19	Walton R. Sexton	56.59	114.56	170.96	241.64	583.75
20	David F. Boyd, jr	58.35	119.49	174.59	230.15	582.58
21	Frederic R. Holman	60.29	118.66	172.16	230.58	581.69
22	Walter M. Falconer	55.82	109.80	164.81	249.17	579.60
23	Albert H. McCarthy	53.66	114.55	174.51	233.13	575.85
24	Hilary Williams	58.59	113.95	169.12	223.19	564.85
25	Willis McDowell	56.84	111.98	169.02	226.16	564.00
26	Oscar D. Duncan	56.28	108.51	167.76	230.50	563.05
27	Arthur St. C. Smith, jr	55.15	112.80	164.21	229.77	561.93
28	Robert W. Henderson	54.75	111.83	165.83	225.60	558.01
29	Austin Kautz	60.04	114.22	164.77	217.40	556.43
30	Charles T. Owens	57.33	107.23	167.77	221.93	554.26
31	William P. Giles	52.58	110.21	166.57	219.61	548.97
32	William C. Asserson	55.87	112.52	161.79	217.29	547.47
33	Alfred C. Owen	60.10	110.80	157.83	213.94	542.67
34	Samuel G. Magill, jr	53.78	104.00	159.55	221.93	539.26
35	Irwin F. Landis	58.23	109.76	155.62	214.44	538.05
36	Clarence S. Kempff	52.64	109.95	156.98	214.52	534.09

[1] Pursuing post-graduate course in Naval Architecture at Naval Academy.

Merit roll for the four years ending June, 1897, of the Naval Cadets of the class appointed in 1893, now performing required service afloat—Engineer Division —10 members.

Order of general merit for four years.	Name.	Aggregate for first year.	Aggregate for second year.	Aggregate for third year.	Aggregate for fourth year.	General aggregate for four years.
	Maxima	76	152	228	304	760
1	Daniel S. Mahony	64.15	117.73	182.02	253.25	617.15
2	Henry L. Collins	60.51	115.16	185.17	248.60	609.44
3	Louis C. Richardson	56.86	118.99	175,22	237.49	588.56
4	Andrew T. Graham	53.91	111.31	172.78	232,57	570.57
5	Henry N. Jenson	53.58	113.69	167,01	233.39	567.07
6	Peter L. Pratt	59.03	106.82	165.18	235.06	566.09
7	William D. Leahy	53.75	107.12	166.89	234.08	561.84
8	George Webber	55.73	112.02	163.80	230.13	561.68
9	Ernest C. Keenan	57.67	105.72	156.63	220.79	540.81
10	George Van Orden	52.88	103 50	160.54	214.42	531.34

Merit roll for the four years ending April, 1898, of the Naval Cadets of the class appointed in 1894, now performing required service afloat—Line Division—28 members.

Order of general merit for four years.	Name.	Aggregate for first year.	Aggregate for second year.	Aggregate for third year.	Aggregate for fourth year.	General aggregate for four years.
	Maxima	76	152	228	304	760
1	John Halligan, jr. [1]	67.40	133.42	200.03	271.78	672.63
2	Henry Williams, [1]	63.79	130.87	200.86	265.30	660.82
3	William C. Watts, [1]	65.25	128.41	195.12	271.87	660.65
4	George L. Smith	62.29	131.25	198.87	266.58	658.99
5	Wilbur G. Briggs	63.05	124.17	184.37	258.30	629.89
6	Ralph N. Marble, jr	59.24	120.73	187.97	256.02	623.96
7	James A. Hand, jr	65.45	127.00	176.21	244.01	612.67
8	Lyman A. Cotten	58.64	118.62	183.56	249.84	610.66
9	Edward Woods	63.83	125.10	178.10	242.33	609.36
10	Charles Boone	62.13	121.52	177.30	245.60	606.55
11	Edward W. McIntyre	62.37	123.29	178.53	237.67	601.86
12	Frank L. Pinney, [1]	61.06	121.63	176.88	239.86	599.43
13	William P. Cronan	54.71	113.99	174.63	252.38	595.71
14	Ulysses S. Macy	58.45	114.43	179.00	242.64	594.52
15	Leno E. Briggs	57.96	123.43	172.08	240.38	593.85
16	Walter B. Tardy	58.45	110.96	172.21	246.65	588.27
17	William T. Tarrant	63.28	120.86	169.93	233.12	587.19
18	Clarence A. Abele	59.12	116.25	165.91	229.50	570.78
19	Yancey S. Williams	60.74	111.26	161.70	234.21	567.91
20	Thomas L. Johnson	57.73	111.00	163.20	233.46	565.39
21	George T. Pettengill	62.65	114.58	161.13	221.64	560.00
22	George C. Sweet	51.91	111.07	168.43	222.83	554.24
23	Franck T. Evans	58.08	107.92	165.54	219.35	550.89
24	Morris H. Brown	60.26	109.09	158.70	216.47	544.52
25	David C. Hanrahan	50.74	107.50	160.65	223.75	542.64
26	John F. Babcock	52.39	101.72	163.31	223.09	540.51
27	Charles P. Nelson	56.83	107.95	160.40	212.60	537.78
28	Walter G. Roper	54.98	104.18	160.97	207.02	527.15

[1] Pursuing post-graduate course in Naval Architecture at Naval Academy.

Merit roll for the four years ending April, 1898, of the Naval Cadets of the class appointed in 1894, now performing required service afloat — Engineer Division—11 members.

Order of general merit for four years.	Name.	Aggregate for first year.	Aggregate for second year.	Aggregate for third year.	Aggregate for fourth year.	General aggregate for four years.
	Maxima	76	152	228	304	760
1	Henry T. Wright[1]	68.93	132.10	189.76	263.42	654.21
2	Herman J. Elson	59.33	127.52	187.78	266.02	640.65
3	Fletcher L. Sheffield	67.51	131.20	186.69	241.59	626.99
4	Henry C. Dinger	60.35	118.51	183.17	252.83	614.86
5	Alexander N. Mitchell	58.81	120.41	179.26	249.12	607.60
6	Louis Shane	63.85	120.11	169.04	250.24	603.24
7	Guy W. Faller	55.02	115.71	169.79	234.30	574.82
8	William B. Wells	58.58	109.93	170.48	231.62	570.61
9	Edward T. Constien	54.27	113.28	166.35	232.09	565.99
10	John A. Schofield	53.78	107.94	161.83	236.10	559.65
11	John S. Graham	52.41	106.10	160.20	220.11	538.82

[1] Pursuing post-graduate course in Naval Architecture at Naval Academy.

Merit roll of the Naval Cadets of the First Class—Line Division—28 Members—Annual Examination, April, 1898.

Order of annual merit.	Name.	Seamanship, naval construction, and naval tactics.	Seamanship, practice cruise.	Ordnance and gunnery.	Navigation and compass deviation.	Navigation, practice cruise.	Least squares and applied mechanics.	Physics.	International law.	Physiology and hygiene.	Efficiency.	Conduct.	Aggregate.
	Maxima	52	8	60	48	8	20	20	16	8	32	32	304
*1	**William C. Watts**	44.46	6.84	54.75	42.60	7.10	18.35	17.55	14.00	7.74	28.48	30.00	271.87
*2	**John Halligan, jr**	44.98	7.30	52.65	42.12	7.06	17.95	17.10	14.76	7.54	29.20	31.12	271.78
*3	**George L. Smith**	43.16	7.38	52.35	42.24	7.02	17.35	17.00	13.56	6.84	28.32	31.36	266.58
*4	**Henry Williams**	44.33	6.96	55.05	40.44	6.30	18.05	17.05	13.64	7.64	26.56	29.28	265.30
5	Wilbur G. Briggs	44.85	6.54	52.35	37.56	7.28	14.60	15.90	14.00	6.58	27.76	30.88	258.30
6	Ralph N. Marble	41.73	6.96	50.25	41.88	6.94	16.60	16.70	13.00	6.44	26.56	28.96	256.02
7	William P. Cronan	46.15	7.20	46.95	38.52	7.22	13.85	14.45	12.56	6.60	28.24	30.64	252.38
8	Lyman A. Cotten	40.69	6.68	49.80	37.68	6.40	14.65	15.30	14.20	5.96	28.00	30.48	249.84
9	Walter B. Tardy	43.94	6.94	48.00	33.96	6.16	14.50	14.55	14.40	7.24	28.48	28.48	246.65
10	Charles Boone	43.29	6.94	47.25	40.08	6.30	13.85	15.35	11.44	5.10	27.92	28.08	245.60
11	James A. Hand, jr	40.56	6.64	49.05	35.88	6.58	14.45	14.45	14.20	7.24	26.56	28.40	244.01
12	Ulysses S. Macy	41.08	6.62	47.40	37.32	6.42	16.70	13.60	12.32	6.70	26.48	28.00	242.64
13	Edward Woods	40.95	6.70	48.00	33.36	6.68	14.55	15.35	14.28	5.98	27.60	28.88	242.33
14	Zeno E. Briggs	41.08	6.40	46.50	35.52	6.96	14.90	14.40	12.96	6.54	26.48	28.64	240.38
15	Frank L. Pinney	40.82	6.24	47.85	34.92	5.30	13.90	14.75	11.68	6.96	27.12	30.32	239.86
16	Edward W. McIntyre	38.09	6.24	46.35	38.40	6.72	13.50	12.35	13.36	7.62	26.40	28.64	237.67
17	Yancey S. Williams	38.09	6.78	45.75	34.44	7.22	14.55	13.50	12.08	5.40	26.64	29.76	234.21
18	Thomas L. Johnson	40.04	6.08	44.25	35.04	5.88	14.75	14.20	12.00	5.86	25.92	29.44	233.46
19	William T. Tarrant	37.18	6.12	46.50	33.96	6.68	14.50	13.40	14.16	6.06	26.32	28.24	233.12
20	Clarence A. Abele	37.31	5.90	44.40	34.68	6.04	13.75	13.80	11.92	5.62	26.32	29.76	229.50
21	David C. Hanrahan	36.27	6.54	45.15	31.68	5.78	12.55	13.00	11.84	6.06	26.72	28.16	223.75
22	John F. Babcock	38.74	6.22	45.90	32.28	5.82	14.05	13.30	10.84	5.86	26.56	23.52	223.09
23	George C. Sweet	37.57	6.06	43.50	32.88	5.90	13.35	14.45	11.60	5.60	26.56	25.36	222.83

24	George T. Pettengill	36.92	6.24	44.70	33.36	6.42	14.40	13.30	10.84	6.10	25.84	23.52	221.64
25	Franck T. Evans	35.10	6.22	42.60	33.24	6.16	12.85	12.80	10.96	5.98	26.00	27.44	219.35
26	Morris H. Brown	37.05	5.94	43.65	32.52	6.36	13.00	12.75	11.88	6.28	26.24	20.80	216.47
27	Charles P. Nelson	35.88	6.78	41.25	31.08	5.68	12.90	12.85	11.28	5.54	26.48	22.88	212.60
28	Walter G. Roper	33.80	5.88	40.80	31.44	6.12	13.45	12.55	11.40	5.34	24.48	21.76	207.02

Merit roll of the Naval Cadets of the First Class—Engineer Division—11 members—Annual Examination, April, 1898.

Order of annual merit.	Name.	Naval construction.	Designing machinery.	Marine engines.	Boilers.	Experimental engineering.	Practice cruise.	Least squares and applied mechanics.	Physics.	Physiology and hygiene.	Efficiency.	Conduct.	Aggregate.
	Maxima	32	48	40	32	20	20	20	20	8	32	32	304
*1	**Herman J. Elson**	26.96	41.52	34.30	27.60	17.20	18.85	16.65	15.60	7.66	29.76	29.92	266.02
*2	**Henry T. Wright**	28.24	36.96	32.50	26.80	18.40	18.15	17.35	16.10	7.80	29.44	31.68	263.42
3	Henry C. Dinger	23.68	37.80	34.60	27.12	17.25	17.30	17.10	16.20	6.74	28.56	26.48	252.83
4	Louis Shane	27.92	38.40	32.40	26.48	16.15	13.65	16.50	15.10	7.40	26.88	29.36	250.24
5	Alexander N. Mitchell	25.12	37.56	30.30	26.32	15.10	17.75	16.40	14.75	6.06	29.12	30.64	249.12
6	Fletcher L. Sheffield	23.36	35.64	29.80	24.88	15.20	15.70	17.15	14.60	5.66	27.84	31.76	241.59
7	John A. Schofield	23.52	32.76	30.50	25.04	15.80	14.95	15.40	14.75	6.42	27.04	29.92	236.10
8	Guy W. Faller	24.16	33.96	28.50	25.20	14.30	14.15	16.35	15.00	5.80	27.12	29.76	234.30
9	Edward T. Constien	23.84	33.24	28.80	24.24	14.00	14.40	15.10	13.65	5.86	27.20	31 76	232.09
10	William B. Wells	21.60	34.92	29.20	22.80	14.45	15.63	15.60	15.20	5.42	26.80	30.00	231.62
11	John S. Graham	21.68	30.60	25.70	22.08	12.50	15.40	14.30	12.65	6.96	28.00	30.24	220.11

Merit roll of the Naval Cadets of the Second Class—54 members—Annual Examination, May, 1898.

Order of annual merit.	Name.	Seamanship.	Astronomy.	Principles of mechanism and marine engines.	Calculus and mechanics.	Physics and chemistry.	French.	Mechanical drawing.	History.	Efficiency.	Conduct.	Aggregate.
	Maxima	12	12	32	48	40	8	12	8	28	28	228
*1	**Herbert G. Sparrow**	11.16	11.37	28.88	43.20	37.40	7.10	9.72	7.34	24.36	27.30	207.83
*2	**Allen Buchanan**	11.34	11.19	26.40	41.40	36.80	6.54	10.53	7.42	25.20	26.46	203.28
e*3	**Guy A. Bisset**	10.17	10.89	27.84	44.52	36.10	6.76	10.44	6.80	22.68	26.32	202.52
*4	**Edward B. Fenner**	10.23	10.80	26.16	38.04	34.10	6.72	10.89	7.00	23.94	26.60	194.48
5	John E. Bailey	9.81	10.11	26.24	41.40	34.20	6.44	9.42	6.70	23.59	24.99	192.90
e 6	John T. Beckner	7.95	9.81	22.88	45.48	33.70	6.18	8.28	6.50	23.03	26.04	189.85
7	Richard D. White	11.01	10.14	27.28	37.68	31.80	7.08	9.75	6.42	23.31	21.49	185.96
8	Henry M. Gleason	9.96	10.44	26.16	35.76	30.60	6.46	10.80	6.38	24.43	24.57	185.56
9	Ernest A. Weichert	8.97	9.36	21.92	36.96	30.00	6.94	9.72	6.96	24.08	27.02	181.93
10	Welborn C. Wood	9.99	9.66	22.00	36.12	31.50	6.32	8.79	6.60	23.38	26.25	180.61
11	Paul B. Dungan	9.27	9.12	25.28	37.20	32.30	5.96	10.32	6.00	23.31	21.63	180.39
12	Claude C. Bloch	9.57	10.38	22.56	36.84	32.40	6.74	8.76	6.20	21.91	24.92	180.28
e13	Everit J. Sadler	9.18	9.36	24.08	36.48	31.80	6.58	9.60	6.16	22.47	24.36	180.07
14	Victor A. Kimberly	9.33	9.12	24.80	38.04	30.60	6.94	10.20	5.78	23.24	21.00	179.05
15	Lloyd S. Shapley	10.26	9.06	24.16	35.64	29.70	5.72	7.92	5.64	23.24	27.02	178.36
16	Hilary H. Royall	8.16	8.97	21.36	39.12	30.90	6.16	9.21	5.66	23.03	25.76	178.33
17	Edward C. Kalbfus	9.51	9.51	21.52	36.00	29.40	6.40	9.60	7.16	23.59	24.92	177.61
18	Henry E. Lackey	10.20	9.03	24.56	31.68	27.10	7.14	9.90	5.56	24.50	26.32	175.99
e19	Farmer Morrison	10.14	9.24	22.88	33.24	31.70	6.32	7.92	5.92	23.45	23.66	174.47
e20	Herbert H. Evans	8.94	8.46	23.60	32.64	31.60	6.36	8.46	6.62	22.47	24.99	174.14
21	James W. L. Clement, jr	10.02	8.76	21.60	34.80	26.40	6.76	8.85	6.90	23.59	24.99	172.67
22	Joseph K. Taussig	9.72	8.76	20.24	31.68	28.30	5.40	10.17	6.50	25.06	26.32	172.15

Merit roll of the Naval Cadets of the Second Class—54 members—Annual Examination, May, 1898—Continued.

Order of annual merit.	Name.	Seamanship.	Astronomy.	Principles of mechanism and marine engines.	Calculus and mechanics.	Physics and chemistry.	French.	Mechanical drawing.	History.	Efficiency.	Conduct.	Aggregate.
	Maxima	12	12	32	48	40	8	12	8	28	28	228
23	Cyrus W. Cole	9.18	8.22	22.72	35.64	26.70	6.12	10.95	5.56	23.10	23.94	172.13
24	John W. Greenslade	9.09	8.79	21.68	32.64	27.10	6.16	10.95	6.32	23.66	25.34	171.73
25	Charles H. Fischer	8.70	8.46	21.44	32.52	28.60	5.80	9.66	5.58	23.87	26.81	171.44
e26	William S. Miller	9.18	8.58	22.56	33.72	29.30	6.98	9.39	6.46	23.10	21.77	171.04
27	Clark H. Woodward	8.31	8.52	21.60	31.32	27.90	6.16	10.80	6.40	23.45	26.46	170.92
28	Harry S. Brinser	8.55	8.46	21.52	34.92	27.00	5.78	9.66	5.66	22.82	26.46	170.83
29	Alexander F. H. Yates	8.64	8.49	21.52	34.68	27.90	6.04	9.06	6.20	22.40	25.41	170.34
30	Samuel I. M. Major	8.88	8.79	21.04	31.44	28.00	6.46	9.12	6.66	23.38	25.83	169.60
e31	James R. Combs	9.30	8.46	24.64	31.08	30.10	6.04	10.98	5.82	22.12	20.79	169.33
32	Adolphus E. Watson	9.21	8.85	21.92	31.32	27.80	6.04	11.34	5.50	23.03	24.08	169.09
33	William R. Sayles	9.27	8.73	20.88	32.52	26.20	5.66	8.64	6.44	23.80	26.60	168.74
34	James H. Tomb	9.15	9.42	21.04	33.96	27.70	6.04	9.06	5.70	22.96	23.52	168.55
35	James E. Mathews	8.85	8.58	20.40	34.08	27.80	6.16	9.27	5.34	22.75	24.85	168.08
e36	Frederick J. Horne	8.34	8.94	20.24	34.32	27.60	6.22	10.20	6.32	22.68	22.96	167.82
37	Alfred W. Johnson	9.27	8.07	21.12	32.64	26.70	6.82	8.67	6.06	23.45	24.64	167.44
38	Samuel B. Thomas	9.63	8.34	21.20	32.64	26.30	5.94	8.91	5.44	24.57	24.36	167.33
39	Frank O. Branch	8.97	8.76	21.52	35.52	27.50	5.28	8.25	5.42	22.33	23.24	166.79
40	Charles E. Courtney	8.73	8.64	20.00	33.72	26.70	5.98	9.30	6.48	22.96	23.94	166.45
41	James B. Gilmer	9.18	8.34	20.32	32.28	26.80	5.46	10.02	6.28	23.03	24.36	166.07
42	Charles E. Morgan	8.94	8.28	21.20	34.08	28.40	6.18	9.03	6.02	22.19	21.28	165.60
43	John E. Lewis	9.51	8.16	21.76	33.96	27.10	5.60	9.36	5.78	23.17	21.00	165.40
44	Frank P. Helm, jr	8.52	8.04	20.64	32.40	26.10	5.70	8.88	5.74	22.82	26.11	164.95

45	Edgar B. Larimer	9.24	7.89	20.40	31.20	26.00	6.02	9.48	5.64	23.17	25.48	164.52
e46	Charles B. Hatch, jr	8.37	8.67	20.88	36.36	27.00	5.90	9.12	5.76	21.35	20.23	163.64
47	John T. Bowers	8.07	8.43	20.48	33.72	28.40	6.78	8.88	5.48	22.61	18.48	161.33
48	Ralph E. Pope	7.80	8.10	20.24	32.76	25.80	5.44	9.21	5.48	22.12	24.22	161.17
e49	Roe W. Vincent	7.86	8.49	20.64	32.64	26.20	5.72	9.93	5.40	22.19	19.95	159.02
e50	Zachariah H. Madison	7.98	7.71	21.44	32.16	27.10	5.72	9.18	5.82	21.21	18.90	157.22
†	Walter M. Hunt	9.27	8.37	19.60	32.28	26.40	5.86	8.43	5.88	22.68	22.89	161.66
†	Chauncey Shackford	8.85	8.37	18.88	30.00	25.50	5.30	7.98	5.22	23.38	27.72	161.20
†	Charles W. Forman	8.49	7.26	20.16	31.20	29.10	5.74	7.98	5.80	22.54	22.26	160.53
¶ s	William N. Jeffers	(a)	(a)	(a)	(a)	(a)	(a)	9.60	(a)	(a)	(a)	(a)

Merit roll of the Naval Cadets of the Third Class—70 members—Annual Examination, May, 1898.

Order of annual merit.	Name.	Trigonometry, analytical geometry, and descriptive geometry.	Physics and chemistry.	English and law.	French and Spanish.	Mechanical drawing.	Efficiency.	Conduct.	Aggregate.
	Maxima	40	16	20	20	24	12	20	152
*1	**Samuel W. Bryant**	35.60	14.12	16.05	19.35	22.74	10.35	17.60	135.81
*2	**Daniel P. Mannix**	32.20	13.88	17.60	18.40	20.22	10.62	19.50	132.42
*3	**William McEntee**	33.50	14.44	16.35	18.40	21.72	10.02	17.80	132.23
*4	**William B. Ferguson, jr**	34.40	14.36	18.60	18.55	18.90	9.96	16.70	131.47
*5	**Joseph R. Defrees**	33.90	13.48	15.85	15.70	21.84	9.84	19.20	129.81
6	Edward S. Jackson, jr	30.40	13.64	17.15	19.60	19.14	9.90	18.70	128.53
7	James C. Kress	33.60	13.64	15.45	15.95	21.96	10.26	17.60	128.46
D 8	William H. Boardman	32.50	13.44	14.85	16.80	21.60	10.20	17.10	126.49
9	Carleton R. Kear	33.60	13.48	15.30	16.95	18.60	9.63	18.85	126.41
10	Frederick R. Naile	30.80	13.44	17.25	18.10	19.14	9.60	17.25	125.58
11	John A. Spilman	31.80	13.92	16.50	17.35	18.54	10.32	17.05	125.48
12	Charles P. Snyder	29.90	13.52	15.70	17.40	19.62	10.05	18.70	124.89
13	John J. Hyland	30.80	11.80	15.35	18.15	19.20	9.57	18.60	123.47
14	Sinclair Gannon	28.20	11.88	15.55	16.40	21.72	10.17	19.00	122.92
15	Willis G. Mitchell	28.80	14.32	15.80	14.50	19.80	10.23	18.75	122.20
16	Charles T. Wade	29.30	13.12	16.45	15.45	20.64	9.69	17.50	122.15
17	Henry L. Wyman	27.00	13.36	15.20	16.65	21.00	9.90	18.25	121.36
18	John D. Wainwright	29.10	11.84	14.65	16.35	21.00	10.08	18.25	121.27
19	William F. Bricker	28.70	12.68	14.45	16.55	19.98	10.20	18.60	121.16
20	Hollis T. Winston	29.10	12.84	15.20	15.50	21.84	9.54	16.05	120.07
21	Julius F. Hellweg	27.80	11.36	15.40	16.30	20.10	9.93	18 55	119.44
22	Arthur B. Keating	27.60	13.04	15.75	17.05	18.48	9.81	17.65	119.38
23	Charles S. Freeman	27.90	12.88	17.30	15.50	16.56	10.02	18.90	119.06
24	Ward K. Wortman	30.00	13.72	13.95	15.70	18.54	9.48	17.05	118.44
25	George W. Steele, jr	25.40	12.20	14.55	17.25	19.98	9.90	18.75	118.03
26	Stafford H. R. Doyle	26.20	12.08	15.65	17.05	18.06	10.05	18.90	117.99
27	John W. Timmons	27.60	12.72	13.80	16.40	19.26	10.38	17.60	117.76
28	Robert Morris	29.40	12.68	13.85	14.95	19.86	9.39	18.00	117.53
29	William K. Riddle	29.70	11.88	15.05	17.55	19.14	9.81	14.40	117.53
30	Stanley Woods	28.80	14.44	13.10	13.65	23.58	9.90	13.95	117.42
31	Frank D. Berrien	28.60	12.24	14.15	16.20	19.86	10.14	16.15	117.34
32	Paul Foley	29.10	10.96	14.85	17.55	19.20	9.90	15.30	116.86
33	William S. Case	28.60	12.48	12.90	15.65	19.44	9.39	18.05	116.51
34	Wilbert Smith	28.60	13.20	15.65	15.65	17.22	9.66	16.45	116.43
35	John G. Church	26.30	12.84	16.15	14.15	18.84	9.69	17.85	115.82
36	Emil P. Svarz	29.10	12.08	13.75	14.25	18.24	9.78	18.10	115.30
37	Carlos A. Gardiner	27.70	11.88	16.55	17.00	18.24	9.48	14.25	115.10
38	Robert L. Berry	28.50	12.36	14.40	15.50	18.78	9.93	15.45	114.92
39	Huntington Johnston	26.80	12.28	13.90	16.15	18.06	9.81	17.80	114.80
40	Harry K. Cage	27.60	12.16	14.00	15.05	18.36	9.84	17.65	114.66
41	George B. Landenberger	28.00	11.88	14.40	14.70	19.86	9.63	15.90	114.37
42	Bayard T. Bulmer	27.40	11.96	14.05	15.30	18.24	9.84	17.55	114.34
43	Robert T. Menner	29.80	12.84	12.90	14.55	17.28	9.39	17.25	114.01
44	Edison E. Scranton	26.90	11.68	14.55	13.80	18.72	9.12	19.05	113.82
45	James H. Comfort	28.10	11.76	14.20	14.45	16.68	9.48	18.75	113.42

D Accidentally shot at Cape San Juan, Porto Rico; died August 10, 1898.

Merit roll of the Naval Cadets of the Third Class—70 members—Annual Examination, May, 1898—Continued.

Order of annual merit.	Name.	Trigonometry, analytical geometry, and descriptive geometry.	Physics and chemistry.	English and law.	French and Spanish.	Mechanical drawing.	Efficiency.	Conduct.	Aggregate.
	Maxima	40	16	20	20	24	12	20	152
46	Herbert C. Cocke	27.10	11.40	13.50	14.45	17.58	10.05	18.55	112.63
47	Clarence L. Arnold	28.10	11.80	13.45	14.00	18.48	9.45	17.10	112.38
48	Edwin H. Dodd	26.80	11.68	14.90	16.60	18.30	9.51	14.40	112.19
49	William V. Tomb	25.60	11.28	14.00	15.00	18.36	9.81	18.05	112.10
50	Charles P. Huff	28.10	13.00	14.15	15.30	17.22	9.09	14.15	111.01
51	Luke E. Wright, jr	26.80	12.00	15.85	16.85	16.08	9.60	13.50	110.68
52	Robert A. Abernathy	26.00	11.72	15.45	15.10	15.72	9.03	17.55	110.57
53	Hayne Ellis	27.10	12.20	13.80	14.30	17.52	9.63	16.00	110.55
54	Benjamin G. Barthalow	26.80	11.64	13.40	14.05	17.82	9.48	16.65	109.84
55	John W. Schoenfeld	27.40	11.72	14.05	13.05	19.62	9.81	14.00	109.65
56	Abram C. Howard	25.70	11.32	13.15	15.90	16.02	9.30	17.15	108.54
57	Charles R. Train	26.00	11.04	12.85	14.10	17.88	10.02	15.20	107.09
58	Clive K. Hulick	26.00	10.64	12.60	14.00	17.64	9.60	16.60	107.08
59	Kirby B. Crittenden	25.70	11.64	14.40	15.85	15.60	9.36	14.10	106.65
60	John M. Caffery	25.00	11.00	12.95	13.05	16.44	9.51	18.45	106.40
61	Loveman Noa	26.10	12.12	13.95	14.65	17.34	9.54	12.70	106.40
62	Clarence E. Landram	25.60	11.88	13.05	14.95	17.22	8.97	12.80	104.47
63	William H. Shea	25.70	11.20	13.25	13.55	16.74	9.75	14.00	104.19
64	Hugo W. Osterhaus	25.10	11.24	12.50	12.75	17.94	9.57	14.55	103.65
65	Hiroaki Tamura	27.30	10.28	11.45	-------	22.32	9.81	19.00	100.16
r	Joseph W. Enbody	23.90	11.52	13.80	15.20	19.68	9.69	18.05	111.84
r	John F. Mann	24.50	11.76	14.70	15.95	16.56	9.42	17.10	109.99
r	Robert T. Wood	24.20	11.76	13.50	15.15	16.14	9.33	14.65	104.73
r	Edward O. Cresap	30.70	-------	-------	-------	22.08	-------	-------	-------
¶ *s*	Henry L. Roosevelt	(*a*)	(*a*)	(*a*)	(*a*)	(*a*)	(*a*)	(*a*)	(*a*)

d Died at his home, June 11, 1898.

Merit roll of the Naval Cadets of the Fourth Class—75 members—Annual Examination, May, 1898.

Order of annual merit.	Name.	Algebra and geometry.	English and history.	French and Spanish.	Efficiency.	Conduct.	Aggregate.
	Maxima	20	20	20	4	12	76
*1	**Alfred G. Howe**	16.10	18.30	18.95	3.47	11.88	68.70
*2	**Ernest J. King**	16.00	18.35	19.15	3.34	11.40	68.24
*3	**William H. Steinhagen**	16.15	18.70	17.70	3.51	11.85	67.91
*4	**Byron A. Long**	17.65	17.60	17.90	3.39	10.98	67.52
*5	**Charles W. Fisher, jr.**	16.50	17.45	19.25	3.28	11.01	67.49
*6	**John T. Burwell**	16.30	17.40	18.75	3.50	11.46	67.41
*7	**Sidney M. Henry**	16.00	18.15	17.70	3.31	11.67	66.83
*8	**Clarence A. Conway**	17.25	17.45	17.25	3.27	11.43	66.65
*9	**Thomas R. Kurtz**	15.85	17.95	17.80	3.28	11.22	66.10
*10	**Lewis S. Cox, jr.**	15.10	17.40	18.95	3.39	11.04	65.88
*11	**Julius A. Furer**	15.90	17.75	17.25	3.32	11.34	65.56
*12	**John P. Jackson**	14.25	17.40	19.55	3.28	10.77	65.25
*13	**Orie W. Fowler**	15.00	17.50	17.45	3.55	11.43	64.93
*14	**James L. Ackerson**	18.30	16.80	15.20	3.39	11.16	64.85
*15	**Benyaurd B. Wygant**	14.55	16.70	18.95	3.22	11.31	64.73
*16	**Lewis B. McBride**	17.65	16.70	16.60	3.30	10.47	64.72
17	Raymond S. Keyes	14.80	17.95	17.05	3.35	11.34	64.49
18	George C. Westervelt	15.80	17.10	16.70	3.42	11.28	64.30
19	Isaac I. Yates	16.10	17.15	15.65	3.47	11.61	63.98
20	Ernest A. Brooks	15.20	17.20	16.60	3.32	11.16	63.48
21	William Norris	15.70	17.25	15.30	3.23	11.31	62.79
22	Percy W. Foote	15.40	15.75	17.70	3.39	10.35	62.59
23	William B. Fogarty	15.90	15.85	16.55	3.26	10.89	62.45
24	Charles T. Hutchins, jr.	13.50	14.80	19.15	3.22	10.92	61.59
25	Adolphus Andrews	16.15	15.40	15.30	3.35	11.37	61.57
26	William S. Pye	14.85	15.45	16.60	3.49	11.13	61.52
27	John M. Enochs	14.55	16.15	15.85	3.24	11.34	61.13
28	John C. Fremont, jr.	13.70	15.30	17.95	3.49	10.65	61.09
29	Arthur P. Fairfield	14.05	16.05	17.10	3.41	10.41	61.02
30	Rufus S. Manley	13.80	16.30	16.50	3.39	11.01	61.00
31	John H. Furse	15.50	16.40	14.85	3.23	10.98	60.96
32	Caspar Goodrich	14.35	15.50	18.45	3.31	9.21	60.82
33	John F. Green	13.45	16.35	16.95	3.23	10.74	60.72
34	Roger Williams	13.10	15.55	16.40	3.47	11.82	60.34
35	Burrell C. Allen	13.20	16.55	15.70	3.32	11.55	60.32
36	Edward C. Hamner, jr.	16.30	14.85	15.15	3.22	10.77	60.29
37	Walter N. Vernou	14.15	14.95	16.45	3.49	10.89	59.93
38	William H. Allen	13.15	15.35	17.35	3.31	10.74	59.90
39	Charles L. Bruff	13.90	16.00	15.75	3.41	10.62	59.68
40	Harold E. Cook	13.60	15.90	14.75	3.42	11.43	59.10
41	Manley H. Simons	13.90	15.55	15.50	3.38	10.71	59.04
41	John H. Walsh	14.20	16.15	14.90	3.17	10.62	59.04
43	Frank McCommon	13.80	15.50	15.20	3.27	11.10	58.87
44	Merlyn G. Cook	14.00	16.30	14.95	3.02	10.50	58.77
45	Holden C. Richardson	14.60	15.05	14.65	3.32	10.80	58.42
46	Frederick L. Oliver	13.90	15.30	14.60	3.31	11.28	58.39
47	John J. Hannigan	12.60	16.45	14.65	3.31	11.37	58.38

Merit roll of the Naval Cadets of the Fourth Class—75 members—Annual Examination, May, 1898—Continued.

Order of annual merit.	Name.	Algebra and geometry.	English and history.	French and Spanish.	Efficiency.	Conduct.	Aggregate.
	Maxima	20	20	20	4	12	76
48	George F. Blair	14.60	13.80	16.60	3.33	9.81	58.14
d 49	Thomas H. Wheeler	12.85	13.85	17.30	3.27	10.71	57.98
50	Wallace Bertholf	14.85	13.50	15.15	3.22	11.10	57.82
51	Edward E. Spafford	13.15	14.80	15.35	3.25	11.22	57.77
52	Guy W. S. Castle	14.30	14.60	14.50	3.35	10.41	57.16
53	Jesse B. Gay	12.80	15.55	15.20	3.09	10.38	57.02
54	Guy Whitlock	13.00	14.65	14.40	3.35	11.61	57.01
55	Ivan E. Bass	13.90	15.55	13.80	3.27	9.93	56.45
56	John Downes, jr	14.00	14.05	14.85	3.44	9.69	56.03
56	John J. Fitzpatrick	12.95	13.45	14.90	3.30	11.43	56.03
58	William W. Galbraith	12.95	14.15	14.10	3.34	11.37	55.91
59	Joseph L. Hileman	12.80	14.70	13.70	3.25	11.22	55.67
60	George F. Neal	12.80	14.30	13.95	3.42	10.86	55.33
61	Newman K. Perry, jr	12.90	14.10	13.65	3.28	11.13	55.06
62	Garrard P. Nightingale	13.30	13.85	13.95	3.37	10.26	54.73
63	Frank R. McCrary	12.90	13.45	13.40	3.22	11.28	54.25
64	Rufus F. Zogbaum, jr	12.65	13.40	14.75	3.47	9.72	53.99
65	Owen H. Oakley	12.75	13.45	12.80	3.51	10.95	53.46
66	Langdon Moore	13.00	13.50	12.50	3.33	10.77	53.10
67	John Rodgers	12.55	13.25	13.95	3.32	9.87	52.94
68	Theodore A. Kittinger	12.90	13.15	13.40	3.24	10.20	52.89
69	John V. Babcock	12.50	13.20	13.15	3.20	10.11	52.16
70	Harold Colvocoresses	12.50	13.80	13.55	3.38	8.85	52.08
r	Claude Browne	12.20	14.40	14.65	3.19	9.54	53.98
r	Howard M. Lloyd	11.35	13.10	13.50	3.23	10.32	51.50
m	William M. Robertson	12.35	12.80	13.65	3.25	8.25	50.30
s ¶	Charles S. Kerrick	(*a*)	(*a*)	(*a*)	(*a*)	(*a*)	(*a*)
s ¶	David A. Weaver	(*a*)	(*a*)	(*a*)	(*a*)	(*a*)	(*a*)

d Drowned near Camp Montauk, September 7, 1898.

REGULATIONS

GOVERNING

THE ADMISSION OF CANDIDATES INTO THE NAVAL ACADEMY AS CADETS.

NOMINATION.

I. The students at the Naval Academy shall be styled *Naval Cadets.*—(*Rev. Stat.*, § 1512, *and Act of Congress approved August* 5, 1882.)

II. There shall be allowed at said Academy one Naval Cadet for every Member or Delegate of the House of Representatives, one for the District of Columbia, and ten at large.—(*Rev. Stat.*, § 1513, *and Act of Congress approved June* 17, 1878.) *Provided, however,* That there shall not be at any time more in said Academy appointed at large than ten.—(*Act of Congress approved August* 5, 1882.)

III. The course of Naval Cadets is six years.—(*Rev. Stat.*, § 1520.) Four years at the Naval Academy and two years at sea, at the expiration of which time the Cadet returns to the Academy for final graduation, and the district then becomes vacant.

IV. Appointments to fill all vacancies that may occur during a year in the lower grades of the Line and Engineer Corps of the Navy and of the Marine Corps will be made from the Naval Cadets, graduates of the year, at the conclusion of their six years' course, in the order of merit as determined by the Academic Board of the Naval Academy. *At least* fifteen appointments from such graduates will be made each year. Surplus graduates who do not receive such appointments will be given a certificate of graduation, an honorable discharge, and one year's sea pay, as provided for Naval Cadets.—(*Act of Congress approved August* 5, 1882.)

V. "The Secretary of the Navy shall, as soon after the fifth of March in each year as possible, notify, in writing, each Member and Delegate of the House of Representatives of any vacancy that may exist in his district. The nomination of a candidate to fill said vacancy shall be made upon the recommendation of the Member or Delegate, if such recommendation is made by the first day of July of that year; but if it is not made by that time the Secretary of the Navy shall fill the vacancy by appointment of an actual resident of the district in which the vacancy exists, who shall have been for at least two years immediately preceding the date of his appointment an actual and bona fide resident of the district in which the vacancy exists and of the legal qualification under the law as now provided. The candidate allowed for the District of Columbia and all the candidates appointed at large shall be selected by the President.—(*Rev. Stat.*, § 1514.)

VI. "Candidates allowed for Congressional districts, for Territories, and for the District of Columbia, must be actual residents of the districts or Territories, respectively, from which they are nominated. *And all candidates must, at the*

*time of their examination for admission, be between the ages of *fifteen and twenty years, and physically sound, well formed, and of robust constitution."*—(*Rev. Stat.*, § 1517.)

VII. Candidates who may be nominated in time to enable them to reach the Academy by the fifteenth of May will receive permission to present themselves on that date to the Superintendent for examination for admission. Those who may not be nominated in time to present themselves at the May examination will be examined on the first of September following.

When either of the above dates shall fall on Sunday the candidates shall present themselves on the Monday following.

Candidates will be required to enter the Academy immediately after passing the prescribed examinations.

No leave of absence will be granted to Cadets of the fourth class.

EXAMINATION.

VIII. "*All candidates for admission into the Academy shall be examined according to such regulations and at such stated times as the Secretary of the Navy may prescribe. Candidates rejected at such examination shall not have the privilege of another examination for admission to the same class unless recommended by the Board of Examiners.*"—(*Rev. Stat.*, § 1515.)

IX. "When any candidate who has been nominated upon the recommendation of a Member or Delegate of the House of Representatives is found, upon examination, to be physically or mentally disqualified for admission, the Member or Delegate shall be notified to recommend another candidate, who shall be examined according to the provisions of the preceding section."—(*Rev. Stat.*, § 1516.)

X. Candidates will be examined physically by a board composed of three medical officers of the Navy at the Naval Academy. Any one of the following conditions will be sufficient to cause the rejection of a candidate, viz:

Feeble constitution, inherited or acquired;

Retarded development;

Impaired general health;

Decided cachexia, diathesis, or predisposition;

Any disease, deformity, or result of injury that would impair efficiency; such as—

Weak or disordered intellect;

Cutaneous or communicable disease;

Unnatural curvature of spine, torticollis, or other deformity;

Inefficiency of either of the extremities or large articulations from any cause;

Epilepsy or other convulsions within five years;

Impaired vision, disease of the organs of vision, imperfect color sense; visual acuteness must not fall below fifteen-twentieths of the normal in either eye;

Impaired hearing or disease of the ear;

Chronic nasal catarrh, ozæna, polypi, or great enlargement of the tonsils;

Impediment of speech to such an extent as to impair efficiency in the performance of duty;

Disease of heart or lungs or decided indications of liability to cardiac or pulmonary affections;

Hernia, complete or incomplete, or undescended testis;

Varicocele, sarcocele, hydrocele, stricture, fistula, hemorrhoids, or varicose veins of lower limbs;

Disease of the genito-urinary organs;

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* Act 2d March, 1889.

Chronic ulcers, ingrowing nails, large bunions, or other deformity of the feet;

Loss of many teeth, or teeth generally unsound.

Attention will also be paid to the stature of the candidate, and no one *manifestly* under size for his age will be received at the Academy. In the case of doubt about the physical condition of the candidate, any marked deviation from the usual standard of height or weight will add materially to the consideration for rejection. Five feet will be the minimum height for the candidate.

XI. Candidates will be examined mentally by the academic board in reading, writing, spelling, arithmetic, geography, English grammar, United States history, world's history, algebra through quadratic equations, and plane geometry (five books of Chauvenet's Geometry, or an equivalent). Deficiency in any one of these subjects may be sufficient to insure the rejection of the candidate.

GENERAL CHARACTER OF THE EXAMINATION.

READING AND WRITING.—Candidates must be able to read understandingly, and with proper accent and emphasis, and to write legibly, neatly, and rapidly.

SPELLING.—They must be able to write, from dictation, paragraphs from standard pieces of English literature, both prose and poetry, sufficient in number to test fully their qualifications in this branch. The spelling throughout the examination will be considered in marking the papers. The Academic Board are instructed not to reject a candidate whose only deficiency is in spelling when the mark therefor is above a certain figure, to be fixed by the board, subject to the revision of the department.

PUNCTUATION AND CAPITALS.—They must be familiar with the rules for punctuation and for the use of capitals. In order to test their knowledge, sentences will be given for correction. Wherever corrections are made the rules for so doing must be given.

GRAMMAR.—Candidates must exhibit thorough familiarity with English grammar; they must be able to analyze and parse any sentence given, showing clearly the relations between the different parts of speech, and giving the rules governing those relations. The subject and predicate in the sentence must be given, with modifiers (if any), and also the part of speech, and kind, case, voice, mood, tense, number, person, degree of comparison, etc., as the case may be, of each word, and its relation to other words in the sentence.

They must be able to define the terms used in grammar, a number of which will be given as a test of their knowledge.

A number of incorrect sentences will be given, and these must be written correctly by the candidate, with the rule, briefly stated, for any change made. (A correct sentence may sometimes be introduced among this number.)

Since the school grammars used in different parts of the country vary among themselves in their treatment of certain words, an answer approved by any grammar of good repute will be accepted.

GEOGRAPHY.—Candidates will be required to pass a satisfactory examination in descriptive geography, particularly of our own country. Questions will be given under the following heads: The definitions of latitude and longitude; the zones; the grand divisions of land and water; the character of coast lines; the direction and position of important mountain chains and the locality of the higher peaks; the position and course of the principal rivers, their tributaries, and the bodies of water into which they flow; the position of important seas, bays, gulfs, and arms of the sea; the position of independent States, their boundaries and capital cities; the position and direction of great peninsulas and the situation of important and prominent capes, straits, sounds, channels, and the most important canals; great lakes and inland seas; position and political connection of important islands and colonial possessions; location of cities

of historical, political, or commercial importance, attention being especially called to the rivers and bodies of water on which cities are situated; the course of a vessel in making a voyage between well known ports.

The candidate's knowledge of the geography of the United States can not be too full or specific on all the points referred to above. Accurate knowledge will also be required of the position of the country with reference to other States, and with reference to latitude and longitude, of the boundaries and relative position of the States and Territories, of the name and position of their capitals, and of other important cities and towns.

United States History.—The examination in this branch will include questions concerning the early settlements in this country; the forms of government in the colonies; the causes, leading events, and results of wars; and prominent events in the history of our Government since its foundation.

World's History.—Candidates must be familiar with the general history of the world, including the rise and the fall of empires and of dynasties; changes in territory as the result of wars or from other causes; the most important treaties of peace; the relations between church and state in different countries; in brief, such information as may be found in the ordinary general histories.

Arithmetic.—The candidate will be required—

To express in figures any whole, decimal, or mixed number; to write in words any given number; to perform with facility and accuracy the various operations of addition, subtraction, multiplication, and division of whole numbers, whether abstract or compound, and to use with facility the tables of money, weights, and measures in common use, including English money.

To reduce compound numbers from one denomination to another, and to express them as decimals or fractions of a higher or lower denomination; to state the number of cubic inches in a gallon and the relation between the troy and avoirdupois pounds, and to reduce differences of time to differences of longitude and *vice versa*.

To define prime and composite numbers; to give the tests of divisibility by 3, 5, 7, 9, 11, 25, and 125; to resolve numbers into their prime factors, and to find the least common multiple and the greatest common divisor of large as well as of small numbers.

To be familiar with all the processes of common and decimal fractions; to give clearly the reasons for such processes, and to be able to use the contracted methods of multiplication and division given in the ordinary text-books on arithmetic.

To define ratio and proportion, and to solve problems in simple and compound proportion.

To solve problems involving the measurement of rectangular surfaces and of solids; to find the square roots and the cube roots of numbers, and to solve simple problems under percentage, interest, and discount.

The candidates are required to possess such a thorough understanding of all the fundamental operations of arithmetic as will enable them to apply the various principles to the solution of any complex problem that can be solved by the methods of arithmetic; in other words, they must possess such a complete knowledge of arithmetic as will enable them to proceed at once to the higher branches of mathematics without further study of arithmetic.

Algebra.—The examination in algebra will include questions and problems upon the fundamental rules, factoring, greatest common divisor, least common multiple, algebraic fractions, equations of the first degree with one or more unknown quantities, simplification of expressions involving surds, and the solution and theory of quadratic equations.

GEOMETRY.—In geometry candidates will be required to give accurate definitions of terms used in plane geometry; to demonstrate any proposition of plane geometry as given in the ordinary text-books, and to solve simple geometrical problems, either by a construction or by an application of algebra.

CHARACTER OF THE QUESTIONS AT EXAMINATION FOR ADMISSION.

PUNCTUATION AND CAPITALS.

Punctuate and capitalize the following:

1. plutarch says lying is the vice of slaves.
2. mills political economy vol I book III Chap IV p 573 etc
3. the scots therefore at break of day entered the castle.
4. Give me a sanctified and just a charitable and humble a religious and contented spirit

(Give the rules for all changes made.)

GRAMMAR.

1. Distinguish between inflection and derivation. What does the inflection of a verb show? The inflection of a pronoun? What parts of speech are not inflected? What is an impersonal verb?
2. Give the possessive plural of cherub, stratum, oasis, Henry. Give the feminine form of monk, czar, abbot, earl.
3. Analyze the following sentence:

"To live with them is far less sweet than to remember thee."

4. Parse the italicised words in the following:

Favors to *none*, to all she smiles *extends*;
Oft she rejects, but never *once* offends."

5. Make corrections, where necessary, in the following:
   (*a*) Whom do men say that I am?
   (*b*) He is a man whom I know is honest.
   (*c*) He could not have failed to have aroused suspicion.
   (*d*) Each of these processes give sure results.

(Where changes are made give the reasons therefor.)

GEOGRAPHY.

1. Fix the positions of the following places: Glasgow, Calcutta, Trieste, Petersburg, Key West.
2. Describe the following rivers, telling were they rise, in what direction they flow, and into what waters they empty: Mohawk, Congo, Brahmaputra, Humber, Dnieper.
3. Where is Cape Wrath? Cape Matapan? Cape Gallinas? Cape Maysi? Cape San Antonio?
4. What is latitude? longitude? Bound Pennsylvania. What is its capital? its metropolis?
5. Make a voyage from Buenos Ayres to Bombay, via the Suez Canal. Name, in order, the waters traveled and the countries passed. Fix the position of three seaports that could be visited on the voyage.

UNITED STATES HISTORY.

1. Give some account of the following: Ponce de Leon; Sir Francis Drake; Peter Minuit; Benedict Arnold; the John Brown Raid. (Take any three.)
2. Name the thirteen original colonies. Explain the three different forms of government (royal, proprietary, and charter) in the colonies.

3. Give some account of the Missouri Compromise; the Geneva Arbitration. What do you understand by the Monroe Doctrine?

4. Name, and give the dates of, three important battles of the Civil War, and state who were the commanders on each side.

WORLD'S HISTORY.

1. Give the dates, causes, and results of the three Punic wars.

2. Give a list of the Stuart rulers of England, with the date of the beginning and the ending of the reign of each.

3. Give some account of the following: Attila; Gustavus Adolphus; Robespierre; William of Orange.

4. State briefly the causes of the following: The Crimean War; the Franco-Prussian War (1870); the Russo-Turkish War (1877–1878).

ARITHMETIC.

1. Divide 26.78508 by .072 (*not* by long division). What decimal part of 2718 is .0047565? Divide 1.51983 by 389.7 and 1838.72 by 7182500. Multiply 37.18756 by 2.78956565, contracting the work to two decimal places in the product. Divide 3.14159265 by 2.71828183 to three decimal places in the quotient.

2. Reduce $4\frac{1}{2}$ d. to the decimal of £1. Express 12 lbs. 7 oz. 6 dwt. 8 gr. in avoirdupois pounds and decimals. How many yards does a train moving 60 miles an hour pass over in one second? How many acres are required for a road 20 miles long and 4 rods wide? How many bushels of grain may be put in a barrel which will hold 40 gallons of water?

3. Simplify each of the fractions $\frac{10\frac{3}{4}-4\frac{1}{12}\frac{1}{2}}{6\frac{3}{16}+7\frac{2}{3}}$ and $\frac{3\frac{5}{11}}{\frac{7}{5}\text{ of }9\frac{1}{11}}$ and multiply their product by $8\frac{3}{4}$. Reduce $\frac{4\frac{7}{9}-3\frac{1}{2}-2\frac{1}{6}+1\frac{7}{18}}{3\frac{5}{9}-2\frac{2}{3}+2\frac{1}{2}-\frac{7}{18}}$ to a simple fraction. Reduce 0.0194 to a common fraction. Find the prime factors of 3553, 7429, and 20387, and express the least common multiple as a product of prime factors.

4. Find the square root of 229.8 to six decimal places, and the cube root of 37.68 to five decimals.

5. Find the simple interest on $595.87 for 3 years 3 months and 3 days at $5\frac{1}{2}$ per cent per annum. Find the simple interest on £757 17 s. 6 d. for 1 year 3 months and 10 days at $4\frac{1}{2}$ per cent per annum. What sum invested at 6 per cent will amount to $2,750.00 in 2 years 9 months 15 days? At an election A received 67,356 votes, B 19,281, C 16,352, and D 10,281; what per cent of the total vote did each obtain.

6. A closed rectangular wooden box has the external dimensions 17 inches, 10 inches, and 6 inches; the wood is $\frac{1}{2}$ inch thick, the empty box weighs $7\frac{1}{2}$ lbs., and when filled with sand the box weighs 100 lbs. Find the weight of a cubic foot of wood and of a cubic foot of sand.

ALGEBRA.

1. Simplify $8x-\left\{16y-[3x-(12y-x)-8y]+x\right\}$. Divide $p^2+pq+2pr-2q^2+7qr-3r^2$ by $p+2q-r$. Multiply together $(x-a)$, $(x-b)$, $(x-c)$, and $(x-d)$, and arrange the result according to descending powers of x. Write the square of $(a+b+c+d)$, and the cube of $(a+b+c)$.

2. Find the greatest common divisor of $3x^3-13x^2+23x-21$ and $6x^3+x^2-44x+21$. Separate into factors x^2-x-12, $6x^2+x-2$, $x^2+(a+c)x+ac$, x^3+a^3, x^4+64 and $a^3+b^3+c^3-3abc$. Simplify $\frac{ax^m-bx^{m+1}}{a^2bx-b^3x^3}$.

3. Solve the equations $\frac{x-8}{7}+\frac{x-3}{3}+\frac{5}{21}=0$, $\frac{x}{4}-\frac{x+10}{5}+4\frac{1}{4}=x-1-\frac{x-2}{3}$, $\frac{1}{5}(x-a)-\frac{1}{5}(2x-3b)-\frac{1}{2}(a-x)=10a+11b$, and $\sqrt{x-13}+\sqrt{x+11}=2$. Divide a quantity a into two parts proportional to b and c.

4. Multiply $2+\sqrt{3}-\sqrt{6}$ by $2-\sqrt{3}+\sqrt{6}$. Simplify $\frac{2+\sqrt{3}}{2-\sqrt{3}}$ and find the square root of $5+\sqrt{24}$. Solve the equations

$$\left.\begin{aligned} x+y+z&=6\\ 3x-y+2z&=7\\ 4x+3y-z&=7 \end{aligned}\right\};\qquad \left.\begin{aligned} 3ax-2by&=c\\ a^2x+b^2y&=5bc \end{aligned}\right\};\qquad \left.\begin{aligned} \frac{a}{x}+\frac{b}{y}&=c\\ \frac{b}{x}-\frac{a}{y}&=d \end{aligned}\right\}.$$

5. Solve the equations $11x^2-19x-6=0$, $(a-b)x^2-(a+b)x+ab=0$, and $\frac{x+22}{3}-\frac{4}{x}=\frac{9x-6}{2}$.

Given the equation $ax^2+bx+c=0$, find the sum and the product of its roots. Find the condition that the roots may be equal; under what circumstances will the roots be rational?

GEOMETRY.

1. Define Theorem, Postulate, Axiom, Corollary, Scholium. Prove that, if a perpendicular be erected at the middle point of a straight line, every point in the perpendicular is equally distant from the extremities of the line and every point not in the perpendicular is unequally distant. What is meant by a geometric locus? Give three examples, and explain what the locus is in each case.

2. Name and define the classes into which quadrilaterals are divided; name and define the species into which parallelograms are divided. Prove that the three perpendiculars erected at the middle points of the sides of a triangle meet in a point; what is this point? Prove that an inscribed angle is measured by one-half the intercepted arc. Two chords are drawn in a circle meeting (1) within the circle, (2) outside the circle; how is the angle between the chords measured in each case? proof not required.

3. What is meant by a *mean proportional* between two lines (or quantities)? When are quantities *reciprocally proportional?* Prove that, when a perpendicular is let fall upon the hypotenuse of a right triangle from the vertex of the right angle, the two triangles so formed are similar, and the perpendicular is a mean proportional between the segments of the hypotenuse. Show how to construct a mean proportional between two lines.

4. Prove that the area of a triangle is one-half the product of its base and altitude. Prove geometrically that the square described upon the hypotenuse of a right triangle is equivalent to the sum of the squares described upon the other two sides.

5. What is meant by dividing a line in *extreme and mean ratio?* A line A B, length a, is divided in extreme and mean ratio; find the two segments, either by construction or by obtaining algebraic expressions for them. Prove that the area of a regular inscribed dodecagon is equal to three times the square of the radius. If the radius is R, what is the length of a side of the dodecagon?

ADMISSION.

XII. Candidates that pass the physical and mental examinations will receive appointments as Naval Cadets, and become students of the Academy. Each cadet will be required to sign articles by which he binds himself to serve in the United States Navy eight years (including his time of probation at the Naval Academy), unless sooner discharged.

The pay of a Naval Cadet is $500 a year, commencing at the date of his admission.

XIII. Cadets will supply themselves, immediately after their admission, with the following articles, viz:

One dress jacket	$20.97
One blouse	12.46
Two pairs trousers	23.24
Six working suits	5.10
One overcoat	26.27
One reefer	10.00
One rubber coat	4.00
One rubber hat	.60
Two pairs of regulation leggings	1.50
Two parade caps	6.10
One knit cap	.68
One mug	.13
One soap box	.63
One laundry book	.25
One pair of blankets	2.50
Two pairs of high shoes	7.50
One pair of overshoes	.66
Eight white shirts	4.40
Twelve linen collars	1.50
Eight pairs of cuffs	1.76
*Eight pairs of socks	2.00
*Eight towels	2.00
*Shaving outfit	1.65
*Four pairs drawers (winter)	4.00
*b Six pairs drawers (summer)	2.40
*Four undershirts (winter)	4.00
*b Six undershirts (summer)	2.40
One hand glass	.36
One blue jersey	1.90
Two striped jerseys	1.80
Three white hats	1.20
	153.96

One jackknife	$0.75
Six sheets	3.00
Hammock clews	.55
One pair of bathing trunks	.20
Three pairs white thread gloves	.54
Two black silk neckties	.46
Two clothes bags	.42
One hammock mattress	3.00
a One requisition book	.30
a One pass book	.30
a Stencil, ink, and brush	.48
a One bottle of indelible ink	.18
a One wash basin and pitcher	.90
a One pair gymnasium slippers	1.12
*One whisk	.15
*One coarse comb	.21
*One cake of soap	.10
*One hairbrush	.55
*Stationery	.50
*Twelve white handkerchiefs	2.40
*One pair of suspenders	.40
*Four suits pajamas	6.00
*One toothbrush	.20
*Thread and needles	.19
*Blacking brush and blacking	.55
*Nailbrush	.30
Six pillowcases	1.50
One black silk neckerchief	.60
Name plate	.30
Two white blouses	4.00
	30.05

When moving into cadet quarters, cadets will supply themselves with the following articles, viz:

a Two bedspreads	$1.70
a Two pairs of drill gloves	1.00
a One slop jar	.85
a Two spatter cloths	.76
One hair pillow	.75
	5.06

One mirror	$1.05
a One rug	.84
a One hair mattress	5.25
a One broom	.18
	7.32

Articles marked *a* will not be taken on board the practice ship.

Of the articles marked *b*, cadets entering in September must have six each.

The articles marked * not being required to conform to a standard pattern, may be brought by the cadet from home, but all other articles must conform to the regulations, and must therefore be supplied by the storekeeper.

Each Naval Cadet must, on admission, deposit with the pay officer the sum of $20, for which he will be credited on the books of that officer, to be expended by direction of the Superintendent in the purchase of text-books and other authorized articles besides those enumerated in the preceding article.

All deposits for clothing and the entrance deposit of $20 must be made before a candidate can be received into the Academy.

SUMMARY OF EXPENSES.

Deposit for clothing, etc	$196.39
Deposit for books, etc	20.00
Total amount required	216.39

The value of clothing brought from home is to be deducted from this amount.

Each naval cadet *one month after admission* will be credited with the amount of his actual expenses in traveling from his home to the Academy.

COURSE OF INSTRUCTION.

[Reference books are marked (*).]

FIRST YEAR—FOURTH CLASS.

FIRST TERM.

Department.	Number of recitations a week.	Number of months.	Subjects.	Text-books.
MATHEMATICS	4	4	ALGEBRA: Fundamental operations; reduction and conversion of fractional and surd quantities; reduction and solution of equations of the first and second degrees; inequalities; involution and evolution; arithmetical, geometrical, and harmonical progression.	Hall and Knight's Elementary Algebra. Hall and Knight's Higher Algebra. Todhunter's Algebra.*
	2	4	GEOMETRY: Geometry of the straight line, of the circle, and of the plane; theory of proportion; properties of similar figures.	Chauvenet's Geometry.
ENGLISH	2	4	ENGLISH: The structure and historical development of the English language; syntax; analysis of sentences; punctuation and capitals; exercises in the composition of letters.	Whitney's Essentials of English Grammar. Hart's Punctuation. Buehler's Practical Exercises in English.* Webster's Dictionary.*
	3	4	HISTORY: Outlines of history, especially the history of Greece and Rome, and of the states of Western Europe; historical geography; important points in naval history, by notes.	Swinton's Outlines of the World's History. Labberton's Historical Atlas.*
LANGUAGES	5	4	FRENCH: By "The Natural Method;" pronunciation drill on the sounds of vowels and the articulations or consonants with their combinations; verb drill on the auxiliaries, the conjugations and the irregulars; lecture, questionnaire, grammaire, and dictée on practical subjects.	Méthode Néel—Le Premier Livret avec Tableaux Muraux. Marion's Le Verbe en Quatre Tableaux Synoptiques. Bercy's Le Français Pratique. Bellow's French-English and English-French Dictionary.*

FIRST YEAR—FOURTH CLASS—Continued.

SECOND TERM.

Department.	Number of recitations a week.	Number of months.	Subjects.	Text-books.
MATHEMATICS	3	4	ALGEBRA: Course for first term continued.	Hall and Knight's Higher Algebra.
			Development of algebraic functions by means of indeterminate coëfficients and the binomial theorem; permutations and combinations; theory of probability; summation of series; continued fractions; logarithms and the use of tables; expomential equations; theory of equations, including the solution of numerical equations; determinants.	Gauss' Logarithms.
	2	4	GEOMETRY: Course for first term continued.	Chauvenet's Geometry.
			Spherical geometry; the cone and the cylinder; mensuration of rectilinear figures, and of the sphere, cone, and cylinder; application of algebra to determinate geometry.	
ENGLISH	2	4	ENGLISH: Words, sentences, and paragraphs; exercises in the composition of letters and telegrams. Themes.	A. S. Hill's Foundations of Rhetoric.
				Buehler's Practical Exercises in English.*
				Webster's Dictionary.*
	3	4	HISTORY: Progress of colonial development in America, and the history of the United States; important points in the naval history of the United States by notes or lectures.	Eliot's History of the United States.
				Mitchell's Atlas.*
LANGUAGES	$5\frac{1}{2}$	4	FRENCH: By "The Natural Method." Course of the first term continued.	Bercy's Le Français Pratique.
				Bercy's Lectures Faciles avec Notes Grammaticales et Explicatives.
				Marion's Le Verbe.
			SPANISH: By "The Natural Method." Given as an advance course, with same subjects as in French.	Worman's First Book in Spanish.
				Cortina's Verbos Españoles.
				Pocket Dictionary, English-Spanish, Tauchnitz edition.*

SECOND YEAR—THIRD CLASS.

FIRST TERM.

Department.	Number of recitations a week.	Number of months.	Subjects.	Text-books.
MATHEMATICS	1	4	DESCRIPTIVE GEOMETRY: Orthographic projections, representation of points, lines, and planes; problems relating to the right line and the plane; representations of surfaces of the second order; projections of the sphere.	Church's Descriptive Geometry. Rittenhouse's Exercises in Descriptive Geometry Drawing.
	4	4	TRIGONOMETRY: Measures of arcs and angles; trigonometric functions; analytical investigations of trigonometric formulas, with their application to all the cases of plane and spherical triangles; construction and use of trigonometric tables; inverse trigonometric functions; De Moivre's theorem; solution of trigonometric equations; practical applications of trigonometry to the solution of plane and spherical triangles, the astronomical triangle, and the measurements of heights and distances.	Chauvenet's Trigonometry. Bowser's Trigonometry. Gauss' Logarithms.
ENGLISH	2	4	ENGLISH: Rhetoric and composition; choice and use of words; kinds of composition; narration and description; argumentative composition; exercises in the composition of official dispatches, letters, and telegrams. Themes.	A. S. Hill's Principles of Rhetoric. Buehler's Practical Exercises in English.* Webster's Dictionary.*
	2	4	LAW: The Constitution of the United States.	Andrews's Manual of the Constitution.
LANGUAGES	3	4	FRENCH: By "The Natural Method." Reading comedies and reciting the parts from memory; writing anecdotes from dictation; sea terms and phrases; personnel; organization; distinguishing flags; honorary distinctions; uniforms; ceremonies and salutes of the French and English navies.	Modern French Comedy. College series. Picard et Ereemantle. Langage Marin: Connaissances utiles aux officiers des Marines de France et d'Angleteere.
			SPANISH: By "The Natural Method." Continued and given as an advanced course.	Modern Spanish Comedy. Sea Terms and Phrases. (Department pamphlet.) Knapp's Spanish Grammar.*

SECOND YEAR—THIRD CLASS—Continued.

FIRST TERM—continued.

Department.	Number of recitations a week.	Number of months.	Subjects.	Text-books.
DRAWING	4	4	MECHANICAL DRAWING: Sketching from models; the use of instruments; construction of scales; notation and symbols used in mechanical drawings; construction of rectilinear and curved figures to scale; drawing section lines; round writing. Drawing exercises in descriptive geometry, including the projections of lines and the representation of planes and geometrical solids, and the projections and sections of surfaces and solids.	Faunce's Mechanical Drawing. Rittenhouse's Exercises in Descriptive Geometry Drawing.
			SECOND TERM.	
PHYSICS	4	4	PHYSICS: An elementary course intended to present the leading principles and the correlation of the branches of physical science, to which more time is devoted during the second and first class years. Constant practice with the fundamental and derived units of the C. G. S. system. Practical work in the physical laboratory; experiments illustrating the daily recitations and exact measurements of length, mass, volume, and specific gravity. Lectures.	Daniell's Principles of Physics. Practical Physics, by Stewart and Gee.
			CHEMISTRY: Recitations in general and organic chemistry. Practical work in the chemical laboratory; experiments illustrating the daily recitations and the determination of simple salts, acids, and bases. Lectures.	Remsen's General Chemistry. Lecture Notes.
MATHEMATICS	5	4	Stereographic Projections and Solutions of the "Astronomical Triangle."	Hendrickson and Dresel's Stereographic Projections.
			ANALYTICAL GEOMETRY: Equations of the straight line and of the conic sections; transformation of coördinates; properties of the conic sections; equations to tangents and normals; determination of loci; discussion of the general equation of the second degree.	C. Smith's Conic Sections.

SECOND YEAR—THIRD CLASS—Continued.

SECOND TERM—continued.

Department.	Number of recitations a week.	Number of months.	Subjects.	Text-books.
ENGLISH	2	4	ENGLISH: Classification of words; definition of words by usage and by derivation; synonyms; laws of change in the meaning of words; faults in diction and their remedies; selection and arrangement; elementary principles of reasoning; principles of composition; exercises in the composition of official dispatches, letters, and telegrams. Themes.	Abbott and Seeley's English Lessons for English People. Abbott's How to Write Clealy. Buehler's Practical Exercises in English.* Webster's Dictionary.*
LANGUAGES	2	4	FRENCH: Course of the first term continued. SPANISH: Course of the first term continued.	Same as for the first term.
DRAWING	$2\frac{1}{4}$	4	MECHANICAL DRAWING: Sketching from models; representation of objects by projections; drawing the projections of models to scale; oblique projections; drawing screws, bolts, nuts, and gearing; round writing.	Faunce's Mechanical Drawing.

THIRD YEAR—SECOND CLASS.

FIRST TERM.

Department.	Number of recitations a week.	Number of months.	Subjects.	Text-books.
SEAMANSHIP	1	4	SEAMANSHIP: Use of the compass, lead, and log; signals; blocks and tackles; running rigging; description and use of sails and their fittings; purchasing weights; boats and their management; ground tackle; handling anchors; handling sails; port drills and evolutions; management under sail, duties of naval cadets; rules of the road.	Luce's Seamanship. Department circulars.
STEAM ENGINEERING	3	4	PRINCIPLES OF MECHANISM: Conversion of circular into reciprocating motion; link work; conversion of reciprocating into circular motion; the teeth of wheels; the use of wheels in trains; aggregate motion; truth of surface and the power of measurement; miscellaneous contrivances.	Goodeve's Elements of Mechanism. Gow's Notes and Problems in Elementary Mechanism.
MECHANICS	5	4	DIFFERENTIAL CALCULUS: Functions; rates; differentials of functions; indeterminate forms; series; maxima and minima; geometrical applications; functions of two or more variables.	Rice and Johnson's Differential Calculus.
			INTEGRAL CALCULUS: The methods of integration; definite integrals; quadrature of surfaces; cubiture of volumes; rectification of curves; centers of gravity; moments of inertia; planimeters; rules for approximate determination of the areas and volumes.	Johnson's Integral Calculus.

THIRD YEAR—SECOND CLASS—Continued.

FIRST TERM—continued.

Department.	Number of recitations a week.	Number of months.	Subjects.	Text-books.
PHYSICS	4	4	PHYSICS: Recitations on simple harmonic motion; wave motions, sound, light, and heat. Practical work in the physical laboratory; experiments illustrating the daily recitations, and some exact measurements, such as the determination of the candlepower of gas and electric lights, index of refraction of glass prisms and lenses and of liquids, focal length of lenses; length of light waves. Photography.	Daniell's Principles of Physics. Ganot's Physics. Stewart's Treatise on Heat. Practical Physics, by Stewart and Gee. Kohlrausch's Physical Measurements. Lecture Notes.
			CHEMISTRY: Short course in chemical analysis.	Stoddard's Outline of Qualitative Analysis for Beginners.
ENGLISH	1	4	HISTORY: The history of the United States Navy.	Maclay's History of the United States Navy.
LANGUAGES	1	4	FRENCH: Conversation upon articles and paragraphs selected from newspapers.	Le Courrier des États-Unis. Langage Marin—continued.
			SPANISH: Same	Las Novedades.
DRAWING	2	4	MECHANICAL DRAWING: Drawing gearing; sketching machinery and making working drawings; round writing; tracings and blue prints of drawings. Topographical and isometrical drawing exercises.	Tomkin's Machine Construction.* Faunce's Mechanical Drawing.

THIRD YEAR—SECOND CLASS—Continued.

SECOND TERM.

Department.	Number of recitations a week.	Number of months.	Subjects.	Text-books.
SEAMANSHIP	1	4	Course of the first term continued	Same as for the first term.
NAVIGATION	2	4	THE CELESTIAL SPHERE: Spherical and rectangular coördinates; use of instruments, especially those for determining terrestrial latitudes and longitudes; refraction; dip; parallax; the earth, sun, planets, and solar system in general; different units of time and calendars; laws of universal gravitation, precession, nutation, and aberration; the moon; eclipses and occultations; tides; comets and meteoric bodies; fixed stars; nebulæ; motion of the solar system; solutions of the astronomical triangle; use of the Nautical Almanac. Dead reckoning and "day's work."	White's Astronomy. Bowditch's Navigator. American Ephemeris and Nautical Almanac.
STEAM ENGINEERING.	3	4	MARINE ENGINES: Early history and progress of marine engineering; work and efficiency; nature and properties of heat; application of heat to water; combustion of coal and economy of fuel; arrangement and efficiency of boilers; fittings and mountings of boilers; corrosion and preservation of boilers; efficiency of the steam; methods of increasing the expansive efficiency of steam; compound engines; condensation of steam; regulating and expansion valves and gear; slide valves and fittings; starting and reversing gears; cylinders and their fittings; condensers and fittings; rotatory motion; details of compound and triple-expansion engines; propulsion, screw propellers; the indicator and indicator diagrams; auxiliary machinery and fittings.	Sennett's Marine Steam Engine. Marine Engines: Problems, Notes, and Sketches. 1895.

THIRD YEAR—SECOND CLASS—Continued.

SECOND TERM—continued.

Department.	Number of recitations a week.	Number of months.	Subjects.	Text-books.
MECHANICS	4¼	4	MECHANICS: Kinematics; statics; kinetics; the motion of projectiles; friction and other resistances; the application of mechanical principles to simple machines and to instruments.	Johnson's Mechanics.
PHYSICS	4	4	PHYSICS: Recitations in light and heat concluded. Electricity and magnetism commenced. Practical work in the physical laboratory; calibration of thermometers; determination of the hygrometric state of the atmosphere; measurements of the coëfficients of expansion and the specific heat and latent heat of various substances; other experiments illustrating the course of study and leading to the skillful use of instruments of precision. Photography. General experiments illustrating the phenomena of statical and voltaic electricity; setting up and comparing galvanic cells and secondary batteries; measuring their resistance and electro-motive force; calibration of galvanometers; determination of dip and horizontal intensity.	Same as for the first term. Thompson's Electricity and Magnetism. Ayrton's Practical Electricity. Day's Exercises in Electrical Measurements.* Lecture notes.
ENGLISH	1	4	HISTORY: The history of the United States Navy.	Maclay's History of the United States Navy.
LANGUAGES	1	4	Course of the first term continued	Same as first term.

FOURTH YEAR—FIRST CLASS—LINE DIVISION.

FIRST TERM.

Department.	Number of recitations a week.	Number of months.	Subjects.	Text-books.
SEAMANSHIP	3	4	SEAMANSHIP: Stowage and organization; boats and their management; ground tackle; handling anchors; handling sails; management under sail and under steam; turning and maneuvering; wharfing, docking, towing, anchoring, mooring, etc.; emergencies; port drills and evolutions; duties of officers and crew; routine; rules of the road; laws of storms and management in cyclones; use of sounding machine.	Luce's Seamanship. Department Circulars. Navy Regulations.
			NAVAL TACTICS: Organization of the fleet; school of the ship; section and squadron; evolutions of the fleet; signaling by Army and Navy code; Navy and International codes of flag signals.	Navy and International Signal Books. Fleet Drill Book (Navy Department).
ORDNANCE	3	4	DRILL REGULATIONS FOR INFANTRY AND ARTILLERY: Schools of the squad, company, battalion, and brigade, in close and extended orders; street-riot drill; ceremonies; arm and away boats.	Drill Regulations for Infantry, Artillery, and Arm and Away Boats, United States Navy, 1898.
			GUNNERY DRILL: Distribution of the crew to the guns and other stations; duties of officers and men; drill of guns of the main and secondary batteries.	Gunnery Drill Book for the New Armaments.
			CLEAR SHIP FOR ACTION	General Instructions; Clearing Ship for Action, 1896
			GUNS AND GUN MOUNTS: Metals used in their construction; description and manufacture of service guns and their mounts for main and secondary batteries; nomenclature, care, and preservation of the ordnance outfit.	Text-book of Ordnance and Gunnery. Descriptions of Modern Ordnance and Modern Gun Mounts.

FOURTH YEAR—FIRST CLASS—LINE DIVISION—Continued.

FIRST TERM—continued.

Department.	Number of recitations a week.	Number of months.	Subjects.	Text-books.
NAVIGATION	4	4	THE THEORY AND PRACTICE OF NAVIGATION, including instruction in the duties of the navigator, the construction and use of navigating instruments, the use of tables, and the solution of problems; determination of meridian distances.	Chauvenet's Spherical and Practical Astronomy.* Coffin's Navigation. Bowditch's Navigator. American Ephemeris and Nautical Almanac.
			HYDROGRAPHIC SURVEYING: The instruments used; selection and measurements of bases; determination of azimuth of base; triangulation; determination of heights; leveling; plotting a survey; hydrographical surveying; tidal observations; current observations; sailing directions; the form of the earth, with special reference to the construction of charts; projections; running surveys.	Phelps's Practical Marine Surveying. Projection Tables. Craig's Azimuth.*
MECHANICS	3	4	METHOD OF LEAST SQUARES: The theory of least squares and probable errors; fundamental principles of the theory; practical methods and formulas; independent observations; conditioned observations.	Johnson's Method of Least Squares.
			HYDROMECHANICS.	Bowser's Hydromechanics.
			APPLIED MECHANICS: Strength of materials; elasticity; stress and strain; theory of structures; strength and deflection of beams; beams of uniform resistance.	Cotterill and Slade's Lesson in Applied Mechanics. Cotterill's Applied Mechanics.
PHYSICS	3	4	PHYSICS: Recitations in electricity and magnetism; practical work in physical laboratory; determination of the constants of galvanometers; testing ammeters and voltmeters; running dynamos and electric motors and measuring their efficiency; experiments on the electric transmission of energy; testing cables and electric-light wires; experiments upon induction; practice in photography and micro-photography.	Same as for the second class year. Thompson's Dynamo Electric Machinery. Lecture Notes.

FOURTH YEAR—FIRST CLASS—LINE DIVISION—Continued.

SECOND TERM.

Department.	Number of recitations a week.	Number of months.	Subjects.	Text-books.
SEAMANSHIP	4	4	NAVAL CONSTRUCTION: Definitions; history and practice of shipbuilding in iron and steel; systems of construction, subdivision, and armoring; systems of pumping, draining, ventilating, steering, and hoisting; fittings in general; distribution of armor, guns, and boats; special constructions; launching; types of ships; structural strength and strains; buoyancy and stability in the intact and the damaged conditions; theory and observation of waves; rolling and pitching; principles of stowage; resistance, propulsion, and steering of ships; qualities of ships; construction and use of diagrams of qualities; the use of qualities; steam steering gear; steam capstan; plans of ships and reproduction in mold loft; finding the displacement of ships and center of buoyancy, etc.	Special Notes and Drawings. Navy Department Pamphlets. White's Manual of Naval Architecture.
ORDNANCE	5	4	BALLISTICS: The laws of combustion of gunpowder; velocities and pressures in guns; rifling, effect on pressure; the motion of projectiles in a nonresisting medium and in air; computation and use of ballistic and range tables; accuracy and probability of fire; derivation of rules for correcting the errors which occur in gunnery practice; the penetration and effect of projectiles.	Interior and Exterior Ballistics. Accuracy and Probability of Fire. Ordnance Notes.
			GUNS: Computation of their elastic strength and shrinkage.	The Elastic Strength of Guns.
			AMMUNITION: Its description, preparation, supply, stowage, and use.	Text-book of Ordnance and Gunnery.
			ARMOR: Description of; use of armor and other protection of matériel and personnel.	
			TORPEDOES: Their description and use.	

FOURTH YEAR—FIRST CLASS—LINE DIVISION—Continued.

SECOND TERM—continued.

Department.	Number of recitations a week.	Number of months.	Subjects.	Text-books.
NAVIGATION	4	4	THEORY OF THE DEVIATION OF THE COMPASS, including the nature and causes of the several parts of deviation, the determination of the vertical and horizontal forces of the earth and ship, the causes and amount of the heeling error, the changes that take place upon a change of geographical position, the graphic representations of the amount and direction of the forces that act on the needle, and the mechanical correction of the deviation and heeling errors. PRACTICAL NAVIGATION. PRACTICAL SURVEYING.	Admiralty Manual for the Deviations of the Compass. Diehl's Practical Problems and the Compensation of the Compass in the United States Navy.*
ENGLISH	2	4	INTERNATIONAL LAW: The objects, sources, and sanctions of international law; the laws of war, embargo, reprisal, and retorsion; blockade; contraband of war; right of search; ship's papers and nationality; prizes; privateering; piracy; the rights and duties of neutrals; jurisdiction over vessels at sea and in territorial waters; fugitives and deserters; licenses to trade; recaptures. *MILITARY LAW: Courts of inquiry; general and summary courts martial.	Snow's International Law. United States Navy Regulations. Lauchheimer's Forms of Procedure.
	¼	4	SPECIAL INSTRUCTIONS: General description of the human body and its functions; the arrest of hemorrhage; resuscitation from drowning; alcoholic drinks, tobacco, and other narcotics. (Lectures and practical instruction Fridays, 7.30 to 9.30 p. m., additional.)	Blaisdell's Practical Physiology.

* The cadets of the Engineer Division also take the course in military law.

FOURTH YEAR—FIRST CLASS—ENGINEER DIVISION.

FIRST TERM.

Department.	Number of recitations a week.	Number of months.	Subjects.	Text-books.
STEAM ENGINEERING	10	4	MARINE ENGINES: Horse-power, nominal and indicated, and the efficiency of the engine; resistance of ships and indicated horse-power necessary for speed; space occupied by, and general description of, modern marine machinery; engines, simple and compound; expansion of steam, mean pressure, etc.; piston speed, stroke of piston, revolutions, size of cylinder, cylinder fittings, etc.; the piston, piston rod, connecting-rod; shafting, cranks, and crank shafts, etc.; foundations, bed-plates, columns, guides, and framing; the condenser, pumps; valves and valve gear; valve diagrams, etc.; propellers; sea cocks and valves; fitting in of machinery, starting and reversing of engines; materials used by the marine engineer.	Seaton's Marine Engineering.
			METALS: Their properties and treatment.	Metals, by A. K. Huntington and W. G. McMillan.
			BOILERS: Fuel, etc., evaporation; proportions; water-tube boilers; boiler details; mountings and fittings; wear and tear; repairs; performance; corrosion; determining the heating value of fuels; forced and natural draught and resistances; measurement of heat produced and wasted; analysis of waste gases; strength of boiler material; design; construction; board of trade rules; management; liquid fuel.	Seaton's Marine Engineering. Stromeyer's Marine Boiler Management and Construction.
			DESIGNING MACHINERY: Materials used in machine construction; straining actions to which machines are subjected; resistance of structures to different kinds of straining action; fastenings, riveted joints, bolts, nuts, keys, and cotters; pipes and cylinders; journals, pivots, axles, and shafting; crank-shaft design; practical designing of various parts of machines.	Unwin's Elements of Machine Design—Parts I. and II.

FOURTH YEAR—FIRST CLASS—ENGINEER DIVISION—Continued.

FIRST TERM—continued.

Department.	Number of recitations a week.	Number of months.	Subjects.	Text-books.
MECHANICS	3	4	Same as for the line division	Same as for the line division.
PHYSICS	3	4	Same as for the line division	Same as for the line division.
			SECOND TERM.	
SEAMANSHIP	4	4	NAVAL CONSTRUCTION: Definitions; history and practice of shipbuilding in iron and steel; systems of construction, subdivision, and armoring; systems of pumping, draining, ventilating, steering, and hoisting; fittings in general; distribution of armor, guns, and boats; special constructions; launching; types of ships; structural strength and strains; buoyancy and stability in the intact and the damaged conditions; theory and observation of waves; rolling and pitching; principles of stowage; resistance, propulsion, and steering of ships; qualities of ships; construction and use of diagrams of qualities; the use of qualities; steam steering gear; steam capstan; plans of ships and reproduction in mold loft; finding the displacement of ships and center of buoyancy, etc.	Special Notes and Drawings. Navy Department Pamphlets. White's Manual of Naval Architecture.

FOURTH YEAR—FIRST CLASS—ENGINEER DIVISION—Continued.

SECOND TERM—continued.

Department.	Number of recitations a week.	Number of months.	Subjects.	Text-books.
STEAM ENGINEERING.	10¾	4	MARINE ENGINES: Physical properties of steam; convertibility of heat and work, internal work; theory of the steam engine; characteristics of a perfect gas; completely superheated steam; thermodynamics of a perfect gas; theory of a heat engine working with a perfect gas; absolute scale of temperatures; performance of a perfect-heat engine; perfect steam engine; generation and expansion of steam; Carnot's principle; comparison of steam and air engines; adibatic equation; adibatic curves; nature of the process of expansion; area of the diagram of energy, mean temperature of supply; entropy; temperature entropy diagram; thermal indicator diagram; entropy of air and steam; losses of efficiency in heat engines; clearance and wire-drawing; feed-water heaters; utilization of low temperatures; formulæ connecting the pressure and temperature of saturated steam; dilitation and specific heat of water; geometry of the curve PV^n =Constant. Casting and molding; pattern making and casting design; smithing and forging; boiler making and plate work; laying off machine work; erecting machinery; metals and alloys.	Cotterill's Steam Engine Considered as a Thermodynamic Machine. Lineham's Mechanical Engineering, Part I.
			BOILERS: Designing and drawing----------	Same as for the first term, with notes.
			DESIGNING MACHINERY: Designing and drawing.	Same as for the first term, with notes.

FOURTH YEAR—FIRST CLASS—ENGINEER DIVISION—Continued.

SECOND TERM—continued.

Department.	Number of recitations a week.	Number of months.	Subjects.	Text-books.
STEAM ENGINEERING—Continued.			EXPERIMENTAL ENGINEERING: Object of engineering experiment; classification of experiment; errors—probability, classification, and rejection; graphical representation of experiments; autographic diagrams; apparatus; testing machines; methods of testing materials of construction; friction testing of lubricants; measurement of power; measurements by meters; flow of steam; gas meters; anemometers; tests of pumps; measurement of pressure; measurement of temperature; measurement of moisture in steam; methods of testing steam boilers; the indicator and the indicator diagram; methods of testing steam engines; experimental determination of inertia; the injector and pulsometer; valve diagrams; refrigerating machinery; standardizing indicators and instruments of precision; dynamometric tests of propellers, etc.	Carpenter's Experimental Engineering.
ENGLISH	¼	4	MILITARY LAW: Courts of inquiry; general and summary courts-martial.	Lauchheimer's Forms of Procedure.
	¼	4	SPECIAL INSTRUCTION: Same as for the line division.	Blaisdell's Practical Physiology.

ASSIGNMENT OF TIME.

Departments.	Fourth class.		Third class.		Second class.		First class, line division.		First class, engineer division.	
	1st term.	2d term.	1st term.	2d term.	1st term.	2d term.	1st term.	2d term.	1st term.	2d term.
Seamanship	------	------	------	------	1	1	3	4	------	3¾
Ordnance	------	------	------	------	------	------	3	5	------	------
Navigation	------	------	------	------	------	2	4	4	------	------
Steam Engineering	------	------	------	------	3	3	------	------	10	10¾
Mechanics	------	------	------	------	5	4¼	3	------	3	------
Physics	------	------	------	4 F	4	4	3	------	3	------
Mathematics	6	5	5	5	------	------	------	------	------	------
English	5	5	4	2	1	1	------	2	------	¼
Languages	5	5¼	3	2	1 F	1 F	------	------	------	------
Drawing	------	------	4	2¼	2	------	------	------	------	------

SPECIAL INSTRUCTION.

Physiology and Hygiene	------	¼ F	------	¼ F

F Friday 7:30 to 9:30 p. m.

PROGRAMME OF RECITATIONS.

FIRST TERM.

Departments.	Fourth class.	Third class.	Second class.	First class, line division.	First class, engineer division.
Seamanship			M. (3)	T., W., Th. (3)	
Ordnance				T., Th. (2), F. (3)	
Navigation				M. (3), W., F., S. (1)	
Steam Engineering			W., Th., F. (3)		W., Th., F., S. (1), M., T., W., Th. F. (2), T. (3).
Mechanics			M., T., W., F. (1), Th. (2)	M., W., F. (2)	M., W., F. (3)
Physics			M., T., W., F. (2)	M., T., Th. (1)	M., T., Th. (1)
Mathematics	M., T., W., Th., F., S. (1)	M., T., W., Th., F. (2)			
English	M., T., W., Th., F. (2)	M., F., S. (1), T. (3)	Th. (1)		
Languages	M., T., W., Th., F. (3)	T., W., Th. (1)	F. (7:30 to 9:30 p. m.)*		
Drawing		M., W., Th., F. (3)	T. (3), S. (1)		

SECOND TERM.

Seamanship			W. (2)	M., T., W., Th. (3)	M., T., W., ‡ Th. (3)
Ordnance				M., T., Th. (2), W. (1), F. (2)	
Navigation			M., T. (3)	M., T., Th., F. (1)	
Steam Engineering			W. Th. F. (3)		M., T., W., Th., F. (1), M., T., W., Th., F. (2), F., ‡(3).
Mechanics			M., W., Th., F.S. (1)†		
Physics		M., T., W., F. (3), F. (7:30 to 9:30 p. m.).*	M., Th., F. (2), T. (1)		
Mathematics	M. T. W. Th. F. (2)	M., T., W., Th , F. (1)			
English	M. T. W. Th. F. (1)	M., Th. (2)	T. (2)	W. (2), F. (3)	
Languages	M., T., W., Th., F. (3), S. (1)†	T., W. (2)	F. (7:30 to 9:30 p. m.)*		
Drawing		Th. (3), F. (2), S. (1)†			
Special Instruction (Physiology and Hygiene)				S. (1)†, F. (7:30 to 9:30 p. m).*	S. (1)†, F. (7:30 to 9:30 p. m).*

* Lectures and practical instruction. † Saturday period, second term, from January 31 to March 10. ‡ Four Wednesday and five Friday periods are devoted to Military Law.

TABLE OF COËFFICIENTS.

Department and subjects.	Fourth class.	Third class.	Second class.	First class, line division.	First class, engineer division.	Maxima for four years, line division.	Maxima for four years, engineer division.	Maxima for final graduation, line division.	Maxima for final graduation, engineer division.
Discipline:									
Conduct	3	5	7	8	8	168	168	------	-------
Efficiency	1	3	7	8	8				
Seamanship.									
Seamanship, Naval Construction, and Naval Tactics*	------	------	3	13	8	------	44	56	32
Practice Cruise	------	------	------	2	------	72	------	------	-------
Ordnance.									
Ordnance Instructions, Infantry Tactics, and Gunnery	------	------	------	†15	------	60	------	44	-------
Ordnance and Gunnery	------	------	------						
Navigation.									
Astronomy, Navigation, and Surveying	------	------	3	12	------	------	12	44	-------
Practice Cruise	------	------	------	2	------	68	------	------	-------
Steam Engineering.									
Principles of Mechanism and Marine Engines	------	------	8	------	------	------	------	20	-------
Practice Cruise	------	------	------	------	5	32	------	------	-------
Marine Engines	------	------	------	------	10	------	------	------	80
Designing Machinery	------	------	------	------	11	------	------	------	32
Boilers	------	------	------	------	8	------	------	------	20
Experimental Engineering	------	------	------	------	5	------	188	------	16
Mechanics.									
Differential and Integral Calculus, and Mechanics	------	------	12	------	------	------	------	------	-------
Least Squares and Applied Mechanics	------	------	------	5	5	68	68	------	-------
Physics.									
Chemistry and Physics	------	4	------	------	------	------	------	------	-------
Physics	------	------	10	5	5	76	76	------	-------
Mathematics.									
Algebra and Geometry	5	------	------	------	------	------	------	------	-------
Trigonometry, Analytical Geometry, and Descriptive Geometry	------	10	------	------	------	60	60	------	-------
English.									
English and History	5	------	2	------	------	------	------	------	-------
English and Law	------	‡5	------	------	------	------	48	------	-------
International and Military Law	------	------	------	4	------	64	------	24	-------
Military Law	------	------	------	------	1	------	4	------	-------
Languages.									
French and Spanish	5	5	2	------	------	48	48	28	28
Drawing.									
Mechanical Drawing	------	6	3	------	------	36	36	------	-------
Miscellaneous.									
Special Instructions (Physiology and Hygiene)	------	------	------	2	2	8	8	------	-------
Cruise Report	------	------	------	------	------	------	------	16	16
Navigation Notebooks, ⁒ Journals and Station Bills	------	------	------	------	------	------	------	8	16
Maxima for each class	76	152	228	304	304	760	760	240	240

* Seamanship and Naval Tactics for line division alone.

† In making up the standing for a year the second term is given double the weight of the first term.

‡ In making up the standing for a year the first term is given double the weight of the second term.

⁒ Navigation notebooks for line division alone.

PRACTICAL INSTRUCTION OF CADETS.

SEAMANSHIP.

Knotting and splicing; compass and lead line; ship nomenclature; cutting and fitting hemp rigging; cutting and fitting wire rigging; rowing, and the management of boats under oars and under sail; sailmaking; making up, bending, unbending, and handling sails; rigging ship; stripping ship; shifting spars; getting under way and anchoring; evolutions with vessels under sail and under steam; signaling, Army and Navy code; management of steam launches; steam fleet tactics with steam launches.

ORDNANCE.

Infantry, schools of the squad, company, and battalion, in close and extended orders; artillery, schools of the battery and battalion; exercise and target practice with small arms and guns of main and secondary batteries; exercise with cane, smallsword, and broadsword; handling and firing torpedoes, use of Riehlé and Rodman testing machines; determinations of velocities; experimental determination of range tables, also of the jump and drift; the preparation, inspection, care, and preservation of ordnance material.

Six medals are awarded annually for marksmanship: Gold, silver, and bronze medals to the cadets of the first class, as first, second, and third prizes, respectively, for excellence in rapid-fire gun practice; and gold, silver, and bronze medals to the cadets of the second class, as first, second, and third prizes, for excellence in practice with the service rifle and revolver.

The cadets of the first class, 1898, were graduated and ordered into active service before the rapid-fire gun practice was completed, and no medals were awarded.

The medals for small-arm marksmanship for 1898 were awarded as follows:

Gold medal to Cadet J. B. Gilmer.

Silver medal to Cadet S. B. Thomas.

Bronze medal to Cadet J. E. Lewis.

On May 23, 1898, the battalion colors were awarded to the Second Division—Cadet Lieutenant J. K. Taussig, commanding—for general excellence during the academic year.

NAVIGATION.

Navigation: Observations, with sextant and artificial horizon, for time, longitude, chronometer correction, latitude, and azimuth.

Surveying: Surveying and constructing a chart of a portion of the Severn River.

Compass Deviations: Swinging an iron ship, and observing the deviations and the times of vibration of horizontal and vertical needles on different courses; from these observations finding the approximate and the exact coëfficients, and the horizontal and the vertical forces acting on the standard and steering compasses; also finding the heeling coëfficients for the same compasses without heeling the ship; also correcting the deviations of a compass, using a Navy compensating binnacle.

STEAM ENGINEERING.

Shop work: The Pattern Shop: Selection and treatment of different woods for different purposes. Elementary work of the carpenter shop, through mortising, joining, etc., to finished pattern work.

The Foundry: Iron and brass casting; the making of bronzes, alloys, etc.

The Blacksmith Shop: Forging, welding, etc.; tempering, casehardening, etc.; bending and quenching tests of metals.

The Boiler Shop: Riveting, soft and hard patching, calking, annealing, tube expanding, etc.; testing.

The Machine Shop: Vise bench work; machine tool work; including the setting of work; turning; planing; boring; slotting, etc.; pipe fitting; building, erection and aligning of engines and engine fitting; preparation of working drawings and working from the same.

Shipwork: Management of main and auxiliary engines; getting up steam at leisure and in emergencies; fire-room and engine-room routine, firing, water tending, and oiling; routine under way when desirable to obtain maximum speed; same for maximum steaming radius; management of engines while maneuvering at sea; determining the condition and locating defects in machinery while in motion; causes and prevention of explosion of boilers, steam pipes, gases in uptakes and in coal bunkers; lying under banked fires; coming to anchor; overhauling machinery; cleaning boilers and condensers; preservation of machinery of a vessel when out of commission; conducting progressive and full-power trials and the collecting of data.

Ordinary Casualties: Hot crown sheets, burst feed pipes, leaky boiler tubes and seams, burnt grate bars, hot pins and journals, fire in bunkers, flooded compartments.

Damages received in battle: Preparations for action; temporary repairs and alternative devices and expedients to be adopted in event of receiving injury from shot or torpedoes; quick methods of disabling machinery about to fall into the hands of the enemy.

Miscellaneous: Use of slide rule, averaging machine, apparatus for testing oils and smoke gases; standardizing steam gauges and indicators; preparing specifications for purchase of machinery and stores; testing, inspection, and preservation of stores; preparation of various cements, paints, and varnishes in ordinary use; selection of coals; making estimates of the amount of coal on hand, prevention of deterioration, etc.; making of watch, quarter, and stations bills.

PHYSICAL TRAINING.

Class drills in calisthenics, free movements and with apparatus.

Special exercises to promote symmetrical development when necessary. Athletic exercises, including boxing and swimming. Dancing.

PROGRAMME OF PRACTICAL INSTRUCTION.

FIRST CLASS.

Months.	Week ending—	Days.	First division.	Second division.	Third division.	Fourth division.
1898.						
October	1	M., T., Th., F., S	Seamanship	Seamanship	Seamanship	Seamanship.
	8	M., T., Th., F., S	Seamanship	Seamanship	Seamanship	Seamanship.
	15	M., T., Th., F	Company	Target, great guns	Artillery	Steam tactics.
		Sat	Company	Seamanship	Artillery	Seamanship.
	22	M., T., Th., F	Artillery	Steam tactics	Company	Target, great guns.
		Sat	Artillery	Battery drill	Company	Battery drill.
	29	M., T., Th., F	Target, great guns	Company	Steam tactics	Artillery.
		Sat	Seamanship	Company	Seamanship	Artillery.
November	5	M., T., Th., F	Steam tactics	Artillery	Target, great guns	Company.
		Sat	Battery drill	Artillery	Battery drill	Company.
	12	M., T., Th., F., S	Battalion infantry	Battalion infantry	Battalion infantry	Battalion infantry.
	19	M., T., Th., F., S	Battalion artillery	Battalion artillery	Battalion artillery	Battalion artillery.
	26	M., T., Th	Steam	Practical ordnance	Practical electricity	Sword exercise.
		F., S	Steam	Practical ordnance	Practical electricity	Sword exercise.
December	3	M., T., Th	Practical electricity	Sword exercise	Steam	Practical ordnance.
		F., S	Practical electricity	Sword exercise	Steam	Practical ordnance.
	10	M., T., Th	Practical ordnance	Steam	Sword exercise	Practical electricity.
		F., S	Practical ordnance	Steam	Sword exercise	Practical electricity.
	17	M., T., Th	Sword exercise	Practical electricity	Practical ordnance	Steam.
		F., S	Sword exercise	Practical electricity	Practical ordnance	Steam.
	24	M., T., Th	Steam	Practical ordnance	Practical electricity	Sword exercise.
		F., S	Steam	Practical ordnance	Practical electricity	Sword exercise.
	31	M., T., Th., F., S	No drills. [See note.]			
1899.						
January	7	M., T., Th	Practical electricity	Sword exercise	Steam	Practical ordnance.
		F., S	Practical electricity	Sword exercise	Steam	Practical ordnance.

PROGRAMME OF PRACTICAL INSTRUCTION—Continued.

FIRST CLASS—Continued.

Months.	Week ending—	Days.	First division.	Second division.	Third division.	Fourth division.
1899.						
January	14	M., T., Th	Practical ordnance	Steam	Sword exercise	Practical electricity.
		F., S	Practical ordnance	Steam	Sword exercise	Practical electricity.
	21	M., T., Th	Sword exercise	Practical electricity	Practical ordnance	Steam.
		F., S	Sword exercise	Practical electricity	Practical ordnance	Steam.
	28	M., T., W., Th., F., S	Semiannual examination. No drills.			
February	4	M., T., Th	Steam	Seamanship	Practical electricity	Sword exercise.
		F., S	Steam	Seamanship	Practical electricity	Sword exercise.
	11	M., T., Th	Practical electricity	Sword exercise	Steam	Seamanship.
		F., S	Practical electricity	Sword exercise	Steam	Seamanship.
	18	M., T., Th	Seamanship	Steam	Sword exercise	Practical electricity.
		F., S	Seamanship	Steam	Sword exercise	Practical electricity.
	25	M., T., Th	Sword exercise	Practical electricity	Seamanship	Steam.
		F., S	Sword exercise	Practical electricity	Seamanship	Steam.
March	4	M., T., Th., F	Battalion artillery	Battalion artillery	Battalion artillery	Battalion artillery.
		Sat	Seamanship	Seamanship	Seamanship	Seamanship.
	11	M., T., Th., F	Target, great guns	Steam tactics	Skirmish	Torpedoes.
		Sat	Battery drill	Seamanship	Battery drill	Seamanship.
		Wednesday, 8	Boats	Boats	Boats	Boats.
	18	M., T., Th., F	Skirmish	Torpedoes	Target, great guns	Steam tactics.
		Sat	Landing party	Seamanship	Landing party	Seamanship.
		Wednesday, 15	Boats	Boats	Boats	Boats.
	25	M., T , Th., F	Steam tactics	Target, great guns	Torpedoes	Skirmish.
		Sat	Seamanship	Battery drill	Seamanship	Battery drill.
		Wednesday, 22	Boats	Boats	Boats	Boats.

April	1	M., T., Th., F	Torpedoes	Skirmish	Steam tactics	Target, great guns.
		Sat	Seamanship	Landing party	Seamanship	Landing party.
		Wednesday, 29	Boats	Boats	Boats	Boats.
	8	M., T., Th., F	Steam tactics	Steam tactics	Steam tactics	Steam tactics.
		Sat	Landing party	Seamanship	Landing party	Seamanship.
		Wednesday, 5	Seamanship	Seamanship	Seamanship	Seamanship.
	15	M., T., Th., F	Seamanship	Battery drill	Seamanship	Battery drill.
		Sat	Seamanship	Battery drill	Seamanship	Battery drill.
		Wednesday, 12	Seamanship	Seamanship	Seamanship	Seamanship.
	22	M., T., Th., F	Battery drill	Seamanship	Battery drill	Seamanship.
		Sat	Battery drill	Seamanship	Battery drill	Seamanship.
		Wednesday, 19	Seamanship	Seamanship	Seamanship	Seamanship.
	29	M., T., Th., F	Seamanship	Seamanship	Seamanship	Seamanship.
		Sat	Seamanship	Landing party	Seamanship	Landing party.
		Wednesday, 26	Seamanship	Seamanship	Seamanship	Seamanship.
May	6	M., T., Th., F	Deviation compass	Deviation compass	Deviation compass	Deviation compass.
		Sat	Seamanship	Seamanship	Seamanship	Seamanship.
		Wednesday, 3	Seamanship	Seamanship	Seamanship	Seamanship.
	13	M., T	Battalion infantry	Battalion infantry	Battalion infantry	Battalion infantry.
		W., Th., F	Battalion artillery	Battalion artillery	Battalion artillery	Battalion artillery.
		Sat	Seamanship	Seamanship	Seamanship	Seamanship.
		Monday	Battalion infantry	Battalion infantry	Battalion infantry	Battalion infantry.
		Tuesday	Battalion artillery	Battalion artillery	Battalion artillery	Battalion artillery.
		Wednesday	Seamanship	Seamanship	Seamanship	Seamanship.
		Thursday	Steam tactics	Steam tactics	Steam tactics	Steam tactics.
		Friday	Battalion infantry	Battalion infantry	Battalion infantry	Battalion infantry.
	20	Saturday	Battle drill	Battle drill	Battle drill	Battle drill.
	27	M., T., W., Th., F., S	Annual examination. No drills.			
June	3	M., T., W., Th., F	Drills for Board of Visitors, as per orders.			

Drills will be suspended from December 24 to January 2. There will be "Fire quarters" on one Wednesday afternoon in each month. Cadets of the Engineer Division of the first class will take part in drills on board the practice ship when under way, in "Practical electricity," in "General steam tactics," and at "Fire quarters." At other times they will have "Steam drill."

PROGRAMME OF PRACTICAL INSTRUCTION—Continued.

SECOND CLASS.

Months.	Week ending—	Days.	First division.	Second division.	Third division.	Fourth division.
1898.						
October	1	M., T., Th., F., S	Seamanship	Seamanship	Seamanship	Seamanship.
	8	M., T., Th., F., S	Seamanship	Seamanship	Seamanship	Seamanship.
	15	M., T., Th., F	Company	Target, machine guns	Artillery	Steam tactics.
		Sat	Company	Seamanship	Artillery	Seamanship.
	22	M., T., Th., F	Artillery	Steam tactics	Company	Target, machine guns.
		Sat	Artillery	Battery drill	Company	Battery drill.
	29	M., T., Th., F	Target, machine guns	Company	Steam tactics	Artillery.
		Sat	Seamanship	Company	Seamanship	Artillery.
November	5	M., T., Th., F	Steam tactics	Artillery	Target, machine guns	Company.
		Sat	Battery drill	Artillery	Battery drill	Company.
	12	M., T., Th., F., S	Battalion infantry	Battalion infantry	Battalion infantry	Battalion infantry.
	19	M., T., Th., F., S	Battalion artillery	Battalion artillery	Battalion artillery	Battalion artillery.
	26	M., T., Th	Steam	Signals	Steam	Sword exercise.
		F., S	Steam	Seamanship	Steam	Sword exercise.
December	3	M., T., Th	Steam	Sword exercise	Steam	Signals.
		F., S	Steam	Sword exercise	Steam	Seamanship.
	10	M., T., Th	Signals	Steam	Sword exercise	Steam.
		F., S	Seamanship	Steam	Sword exercise	Steam.
	17	M., T., Th	Sword exercise	Steam	Signals	Steam.
		F., S	Sword exercise	Steam	Seamanship	Steam.
	24	M., T., Th	Steam	Signals	Steam	Sword exercise.
		F., S	Steam	Seamanship	Steam	Sword exercise.
	31	M., T., Th., F., S	No drills. [See note.]			
1899.						
January	7	M., T., Th	Steam	Sword exercise	Steam	Signals.
		F., S	Steam	Sword exercise	Steam	Seamanship.

	14	M., T., Th	Signals	Steam	Sword exercise	Steam.
		F., S	Seamanship	Steam	Sword exercise	Steam.
	21	M., T., Th	Sword exercise	Steam	Signals	Steam.
		F., S	Sword exercise	Steam	Seamanship	Steam.
	28	M., T., W., Th., F., S	Semiannual examination. No drills.			
February	4	M., T., Th	Steam	Practical ordnance	Steam	Sword exercise.
		F., S	Steam	Practical ordnance	Steam	Sword exercise.
	11	M., T., Th	Steam	Sword exercise	Steam	Practical ordnance.
		F., S	Steam	Sword exercise	Steam	Practical ordnance.
	18	M., T., Th	Practical ordnance	Steam	Sword exercise	Steam.
		F., S	Practical ordnance	Steam	Sword exercise	Steam.
	25	M., T., Th	Sword exercise	Steam	Practical ordnance	Steam.
		F., S	Sword exercise	Steam	Practical ordnance	Steam.
March	4	M., T., Th., F	Battalion artillery	Battalion artillery	Battalion artillery	Battalion artillery.
		Sat	Seamanship	Seamanship	Seamanship	Seamanship.
	11	M., T., Th., F	Target, great guns	Steam tactics	Skirmish	Target, small arms.
		Sat	Battery drill	Seamanship	Battery drill	Seamanship.
		Wednesday, 8	Boats	Boats	Boats	Boats.
	18	M., T., Th., F	Skirmish	Target, small arms	Target, great guns	Steam tactics.
		Sat	Landing party	Seamanship	Landing party	Seamanship.
		Wednesday, 15	Boats	Boats	Boats	Boats.
	25	M., T., Th., F	Steam tactics	Target, great guns	Target, small arms	Skirmish.
		Sat	Seamanship	Battery drill	Seamanship	Battery drill.
		Wednesday, 22	Boats	Boats	Boats	Boats.
April	1	M., T., Th., F	Target, small arms	Skirmish	Steam tactics	Target, great guns.
		Sat	Seamanship	Landing party	Seamanship	Landing party.
		Wednesday, 29	Boats	Boats	Boats	Boats.
	8	M., T., Th., F	Seamanship	Seamanship	Seamanship	Seamanship.
		Sat	Landing party	Seamanship	Landing party	Seamanship.
		Wednesday, 5	Seamanship	Seamanship	Seamanship	Seamanship.
	15	M., T., Th., F	Seamanship	Battery drill	Seamanship	Battery drill.
		Sat	Seamanship	Battery drill	Seamanship	Battery drill.
		Wednesday, 12	Seamanship	Seamanship	Seamanship	Seamanship.

PROGRAMME OF PRACTICAL INSTRUCTION—Continued.

SECOND CLASS—Continued.

Months.	Week ending—	Days.	First division.	Second division.	Third division.	Fourth division.
1899.						
April	22	M., T., Th., F	Battery drill	Seamanship	Battery drill	Seamanship.
		Sat	Battery drill	Seamanship	Battery drill	Seamanship.
		Wednesday, 19	Seamanship	Seamanship	Seamanship	Seamanship.
	29	M., T., Th., F	Seamanship	Seamanship	Seamanship	Seamanship.
		Sat	Seamanship	Landing party	Seamanship	Landing party.
		Wednesday, 26	Seamanship	Seamanship	Seamanship	Seamanship.
May	6	M., T., Th., F	Company	Company	Company	Company.
		Sat	Seamanship	Seamanship	Seamanship	Seamanship.
		Wednesday, 3	Seamanship	Seamanship	Seamanship	Seamanship.
	13	M., T	Battalion infantry	Battalion infantry	Battalion infantry	Battalion infantry.
		W., Th., F	Battalion artillery	Battalion artillery	Battalion artillery	Battalion artillery.
		Sat	Seamanship	Seamanship	Seamanship	Seamanship.
		Monday	Battalion infantry	Battalion infantry	Battalion infantry	Battalion infantry.
		Tuesday	Battalion artillery	Battalion artillery	Battalion artillery	Battalion artillery.
		Wednesday	Seamanship	Seamanship	Seamanship	Seamanship.
		Thursday	Steam tactics	Steam tactics	Steam tactics	Steam tactics.
		Friday	Battalion infantry	Battalion infantry	Battalion infantry	Battalion infantry.
	20	Saturday	Battle drill	Battle drill	Battle drill	Battle drill.
	27	M., T., W., Th., F., S	Annual examination. No drills.			
June	3	M., T., W., Th., F	Drills for Board of Visitors, as per orders.			

Drills will be suspended from December 24 to January 2. There will be "Fire quarters" on one Wednesday afternoon in each month.

1898.						
October	1	M., T., Th., F., S	Seamanship	Seamanship	Seamanship	Seamanship.
	8	M., T., Th., F., S	Seamanship	Seamanship	Seamanship	Seamanship.
	15	M., T., Th., F	Company	Boats	Artillery	Boats.
		Sat	Company	Seamanship	Artillery	Seamanship.
	22	M., T., Th., F	Artillery	Boats	Company	Boats.
		Sat	Artillery	Battery drill	Company	Battery drill.
	29	M., T., Th., F	Boats	Company	Boats	Artillery.
		Sat	Seamanship	Company	Seamanship	Artillery.
November	5	M., T., Th., F	Boats	Artillery	Boats	Company.
		Sat	Battery drill	Artillery	Battery drill	Company.
	12	M., T. Th., F., S	Battalion infantry	Battalion infantry	Battalion infantry	Battalion infantry.
	19	M., T., Th., F., S	Battalion artillery	Battalion artillery	Battalion artillery	Battalion artillery.
	26	M., T., Th	Steam	Seamanship	Target, small arms	Sword exercise.
		F., S	Steam	Seamanship	Great guns	Sword exercise.
December	3	M., T., Th	Target, small arms	Sword exercise	Steam	Seamanship.
		F., S	Great guns	Sword exercise	Steam	Seamanship.
	10	M., T., Th	Seamanship	Steam	Sword exercise	Target, small arms.
		F., S	Seamanship	Steam	Sword exercise	Great guns.
	17	M., T., Th	Sword exercise	Target, small arms	Seamanship	Steam.
		F., S	Sword exercise	Great guns	Seamanship	Steam.
	24	M., T., Th	Steam	Seamanship	Target, small arms	Sword exercise.
		F., S	Steam	Seamanship	Great guns	Sword exercise.
	31	M., T., Th., F., S	No drills. [See note.]			
1899.						
January	7	M., T., Th	Target, small arms	Sword exercise	Steam	Seamanship.
		F., S	Great guns	Sword exercise	Steam	Seamanship.
	14	M., T., Th	Seamanship	Steam	Sword exercise	Target, small arms.
		F., S	Seamanship	Steam	Sword exercise	Great guns.

PROGRAMME OF PRACTICAL INSTRUCTION—Continued.

THIRD CLASS—Continued.

Months.	Week ending—	Days.	First division.	Second division.	Third division.	Fourth division.
1899.						
January	21	M., T., Th	Sword exercise	Target, small arms	Seamanship	Steam.
		F., S	Sword exercise	Great guns	Seamanship	Steam.
	28	M., T., W., Th., F., S	Semiannual examination. No drills.			
February	4	M., T., Th	Steam	Signals	Target, small arms	Sword exercise.
		F., S	Steam	Seamanship	Great guns	Sword exercise.
	11	M., T., Th	Target, small arms	Sword exercise	Steam	Signals.
		F , S	Great guns	Sword exercise	Steam	Seamanship.
	18	M., T., Th	Signals	Steam	Sword exercise	Target, small arms.
		F., S	Seamanship	Steam	Sword exercise	Great guns.
	25	M., T., Th	Sword exercise	Target, small arms	Signals	Steam.
		F., S	Sword exercise	Great guns	Seamanship	Steam.
March	4	M., T., Th., F	Battalion artillery	Battalion artillery	Battalion artillery	Battalion artillery.
		Sat	Seamanship	Seamanship	Seamanship	Seamanship.
	11	M., T., Th., F	Target, small arms	Seamanship	Skirmish	Boats.
		Sat	Battery drill	Seamanship	Battery drill	Seamanship.
		Wednesday, 8	Boats	Boats	Boats	Boats.
	18	M., T., Th., F	Skirmish	Boats	Target, small arms	Seamanship.
		Sat	Landing party	Seamanship	Landing party	Seamanship.
		Wednesday, 15	Boats	Boats	Boats	Boats.
	25	M., T., Th., F	Seamanship	Target, small arms	Boats	Skirmish.
		Sat	Seamanship	Battery drill	Seamanship	Battery drill.
		Wednesday, 22	Boats	Boats	Boats	Boats.
April	1	M., T., Th., F	Boats	Skirmish	Seamanship	Target, small arms.
		Sat	Seamanship	Landing party	Seamanship	Landing party.
		Wednesday, 29	Boats	Boats	Boats	Boats.

	8	M., T., Th., F	Seamanship	Seamanship	Seamanship	Seamanship.
		Sat	Landing party	Seamanship	Landing party	Seamanship.
		Wednesday, 5	Seamanship	Seamanship	Seamanship	Seamanship.
	15	M., T., Th., F	Seamanship	Battery drill	Seamanship	Battery drill
		Sat	Seamanship	Battery drill	Seamanship	Battery drill.
		Wednesday, 12	Seamanship	Seamanship	Seamanship	Seamanship.
	22	M., T., Th., F	Battery drill	Seamanship	Battery drill	Seamanship.
		Sat	Battery drill	Seamanship	Battery drill	Seamanship.
		Wednesday, 19	Seamanship	Seamanship	Seamanship	Seamanship.
	29	M., T., Th., F	Seamanship	Seamanship	Seamanship	Seamanship.
		Sat	Seamanship	Landing party	Seamanship	Landing party.
		Wednesday, 26	Seamanship	Seamanship	Seamanship	Seamanship.
May	6	M., T., Th., F	Company	Company	Company	Company.
		Sat	Seamanship	Seamanship	Seamanship	Seamanship.
		Wednesday, 3	Seamanship	Seamanship	Seamanship	Seamanship.
	13	M., T	Battalion infantry	Battalion infantry	Battalion infantry	Battalion infantry.
		W., Th., F	Battalion artillery	Battalion artillery	Battalion artillery	Battalion artillery.
		Sat	Seamanship	Seamanship	Seamanship	Seamanship.
		Monday	Battalion infantry	Battalion infantry	Battalion infantry	Battalion infantry.
		Tuesday	Battalion artillery	Battalion artillery	Battalion artillery	Battalion artillery.
		Wednesday	Seamanship	Seamanship	Seamanship	Seamanship.
		Thursday	Boats	Boats	Boats	Boats.
		Friday	Battalion infantry	Battalion infantry	Battalion infantry	Battalion infantry.
	20	Saturday	Battle drill	Battle drill	Battle drill	Battle drill.
	27	M., T., W., Th., F., S	Annual examination. No drills.			
June	3	M., T., W., Th., F	Drills for Board of Visitors, as per orders.			

Drills will be suspended from December 24 to January 2. There will be "Fire quarters" on one Wednesday afternoon in each month.

PROGRAMME OF PRACTICAL INSTRUCTION—Continued.

FOURTH CLASS.

Months.	Week ending—	Days.	First division.	Second division.	Third division.	Fourth division.
1898.						
October	1	M., T., Th., F., S	Seamanship	Seamanship	Seamanship	Seamanship.
	8	M., T., Th., F., S	Seamanship	Seamanship	Seamanship	Seamanship.
	15	M., T., Th., F	Company	Boats	Artillery	Boats.
		Sat	Company	Seamanship	Artillery	Seamanship.
	22	M., T., Th., F	Artillery	Boats	Company	Boats.
		Sat	Artillery	Battery drill	Company	Battery drill.
	29	M., T., Th., F	Boats	Company	Boats	Artillery.
		Sat	Seamanship	Company	Seamanship	Artillery.
November	5	M., T., Th., F	Boats	Artillery	Boats	Company.
		Sat	Battery drill	Artillery	Battery drill	Company.
	12	M., T., Th., F., S	Battalion infantry	Battalion infantry	Battalion infantry	Battalion infantry.
	19	M., T., Th., F., S	Battalion artillery	Battalion artillery	Battalion artillery	Battalion artillery.
	26	M., T., Th	Gymnastics	Dancing	Gymnastics	Dancing.
		F., S	Gymnastics	Seamanship	Gymnastics	Seamanship.
December	3	M., T., Th	Gymnastics	Dancing	Gymnastics	Dancing.
		F., S	Gymnastics	Seamanship	Gymnastics	Seamanship.
	10	M., T., Th	Dancing	Gymnastics	Dancing	Gymnastics.
		F., S	Seamanship	Gymnastics	Seamanship	Gymnastics.
	17	M., T., Th	Dancing	Gymnastics	Dancing	Gymnastics.
		F., S	Seamanship	Gymnastics	Seamanship	Gymnastics.
	24	M., T., Th	Gymnastics	Dancing	Gymnastics	Dancing.
		F., S	Gymnastics	Seamanship	Gymnastics	Seamanship.
	31	M., T., Th., F., S	No drills. [See note.]			
1899.						
January	7	M., T., Th	Gymnastics	Dancing	Gymnastics	Dancing.
		F., S	Gymnastics	Seamanship	Gymnastics	Seamanship.

	14	M., T., Th	Dancing	Gymnastics	Dancing	Gymnastics.
		F., S	Seamanship	Gymnastics	Seamanship	Gymnastics.
	21	M., T., Th	Dancing	Gymnastics	Dancing	Gymnastics.
		F., S	Seamanship	Gymnastics	Seamanship	Gymnastics.
	28	M., T., W., Th., F., S	Semiannual examination. No drills.			
February	4	M., T., Th	Gymnastics	Dancing	Gymnastics	Dancing.
		F., S	Gymnastics	Seamanship	Gymnastics	Great guns.
	11	M., T., Th	Gymnastics	Dancing	Gymnastics	Dancing.
		F., S	Gymnastics	Great guns	Gymnastics	Seamanship.
	18	M., T., Th	Dancing	Gymnastics	Dancing	Gymnastics.
		F., S	Seamanship	Gymnastics	Great guns	Gymnastics.
	25	M., T., Th	Dancing	Gymnastics	Dancing	Gymnastics.
		F., S	Great guns	Gymnastics	Seamanship	Gymnastics.
March	4	M., T., Th., F	Battalion artillery	Battalion artillery	Battalion artillery	Battalion artillery.
		Sat	Seamanship	Seamanship	Seamanship	Seamanship.
	11	M., T., Th., F	Gymnastics	Seamanship	Skirmish	Boats.
		Sat	Battery drill	Seamanship	Battery drill	Seamanship.
		Wednesday, 8	Boats	Boats	Boats	Boats.
	18	M., T., Th., F	Skirmish	Boats	Gymnastics	Seamanship.
		Sat	Landing party	Seamanship	Landing party	Seamanship.
		Wednesday, 15	Boats	Boats	Boats	Boats.
	25	M., T., Th., F	Seamanship	Gymnastics	Boats	Skirmish.
		Sat	Seamanship	Battery drill	Seamanship	Battery drill.
		Wednesday, 22	Boats	Boats	Boats	Boats.
April	1	M., T., Th., F	Boats	Skirmish	Seamanship	Gymnastics.
		Sat	Seamanship	Landing party	Seamanship	Landing party.
		Wednesday, 29	Boats	Boats	Boats	Boats.
	8	M., T., Th., F	Seamanship	Seamanship	Seamanship	Seamanship.
		Sat	Landing party	Seamanship	Landing party	Seamanship.
		Wednesday, 5	Seamanship	Seamanship	Seamanship	Seamanship.
	15	M., T., Th., F	Seamanship	Battery drill	Seamanship	Battery drill.
		Sat	Seamanship	Battery drill	Seamanship	Battery drill.
		Wednesday, 12	Seamanship	Seamanship	Seamanship	Seamanship.

PROGRAMME OF PRACTICAL INSTRUCTION—Continued.

FOURTH CLASS—Continued.

Months.	Week ending—	Days.	First division.	Second division.	Third division.	Fourth division.
1899.						
April	22	M., T., Th., F	Battery drill	Seamanship	Battery drill	Seamanship.
		Sat	Battery drill	Seamanship	Battery drill	Seamanship.
		Wednesday, 19	Seamanship	Seamanship	Seamanship	Seamanship.
	29	M., T., Th., F	Seamanship	Seamanship	Seamanship	Seamanship.
		Sat	Seamanship	Landing party	Seamanship	Landing party.
		Wednesday, 26	Seamanship	Seamanship	Seamanship	Seamanship.
May	6	M., T., Th., F	Company	Company	Company	Company.
		Sat	Seamanship	Seamanship	Seamanship	Seamanship.
		Wednesday, 3	Seamanship	Seamanship	Seamanship	Seamanship.
May	13	M., T	Battalion infantry	Battalion infantry	Battalion infantry	Battalion infantry.
		W., Th., F	Battalion artillery	Battalion artillery	Battalion artillery	Battalion artillery.
		Sat	Seamanship	Seamanship	Seamanship	Seamanship.
		Monday	Battalion infantry	Battalion infantry	Battalion infantry	Battalion infantry.
		Tuesday	Battalion artillery	Battalion artillery	Battalion artillery	Battalion artillery.
		Wednesday	Seamanship	Seamanship	Seamanship	Seamanship.
		Thursday	Boats	Boats	Boats	Boats.
		Friday	Battalion infantry	Battalion infantry	Battalion infantry	Battalion infantry.
	20	Saturday	Battle drill	Battle drill	Battle drill	Battle drill.
	27	M., T., W., Th., F., S	Annual examination. No drills.			
June	3	M., T., W., Th., F	Drills for Board of Visitors, as per orders.			

Drills will be suspended from December 24 to January 2. There will be "Fire quarters" on one Wednesday afternoon in each month.

SUMMER ROUTINE.

(May 20 until October 1.)

Daily, except Sunday.

8:30 to 10 a. m. Setting up drill, and infantry, in the armory.
10:20 to meridian. Swimming drill in the natatorium.
Cadets proficient in swimming are instructed in knotting, splicing, rigging, nomenclature of spars, and other practical work in the rigging loft, and sail loft.

Daily, except Saturday and Sunday.

4 to 6 p. m. Drill in the cutters with oars, and under sail.
8 to 9 p. m. Gymnasium drill

SUMMARY OF PRACTICAL INSTRUCTION.

Kind of instruction.	During the academic year.				Total number of instructions during academic year.	During summer months.				Total number of instructions.
						Practice cruise.				
	First class.	Second class.	Third class.	Fourth class.		First class.	Second class.	Third class.	Fourth class.	
Seamanship	58	59	105	81	303					303
Boats under oars, or sail	4	4	37	33	78					78
Steam tactics	37	33			70					70
Signals		24	12		36					36
Battery drill	4	4	14	14	36					36
Target practice, great guns	32	16			48					48
Battle drill	1	1	1	1	4					4
Landing party	4	4	4	4	16					16
Torpedoes	16				16					16
Practical ordnance	40	20			60					60
Artillery	20	20	20	20	80					80
Battalion artillery	13	13	13	13	52					52
Target practice, machine guns		16			16					16
Target practice, small arms		16	52		68					68
Company	20	24	24	24	92					92
Battalion infantry	9	9	9	9	36					36
Skirmish drill	16	16	16	16	64					64
Sword exercise	60	60	60		180					180
Practical instruction in deviation of compass	4				4					4
Practical instruction, navigation	*14									†14
Practical instruction, surveying	*10									†10
Steam	†14	29	14		57					209
	‡152				152					
Running steam launches	37				37					37
Practical electricity	60				60					60

*Study periods. †Line Division. ‡Engineer Division.

SUMMARY OF PRACTICAL INSTRUCTION—Continued.

Kind of instruction.	During the academic year.				Total number of instructions during academic year	During summer months.				Total number of instructions.
						Practice cruise.				
	First class.	Second class.	Third class.	Fourth class.		First class.	Second class.	Third class.	Fourth class.	
Practical instruction in rigging loft, and in sail loft										112
Gymnastics and boxing				76	76				94	170
Swimming									112	112
Dancing				36	36					36
Boats									94	94
Setting-up drill									112	112

The instructions in seamanship and gunnery on board of the practice steamers are also made instructions in running and managing the engines and boilers of those vessels. The instructions in naval tactics are also made instructions in running and managing the engines and boilers of the steam launches when practicable.

*POST-GRADUATE COURSE IN NAVAL ARCHITECTURE.

SUBJECT-MATTER OF PRINCIPAL COURSES.

A.—Ship Building and Design.

a. First year.

1. Introduction and generalities.
   (1) Importance of subject; part played in the life of nations.
   (2) Historic sketch of growth and development.
   (3) Outline of the purpose and object of the study, of its scope and its limitations, of the method and sequence of treatment.
   (4) Classification of vessels and analysis of the parts that make up a vessel.
2. Method of procedure in the construction of a vessel. (Treated in outline.)
   (1) Appropriation by Congress: Derived from naval policy, growing out of national policy, interpreted by Administration.
   (2) Preparation of approximate designs—proposals, specifications, contracts.
   (3) Preparation of working plans—ordering material, laying down, mold loft.
   (4) Preparation of building slip—keel blocks, shores, scaffolding.
   (5) Receipt and inspection of material—Handling—Stowing—Pickling.
   (6) Preparation and history of material—Bending, laying off, punching, shearing, countersinking, drilling, machining.
   (7) Erecting—Securing in place—Harpings—Shores—Bolting—Riveting.
   (8) Co-ordination and co-operation in all features—In ordering, preparing material, in advancing different parts of construction simultaneously.
3. *The construction of the parts of a battle ship.*
   (1) *The skeleton.*
      a Keels.
      b Stems and sternposts.
      c Framing.
      d Longitudinals.
      e Deck beams and stanchions.
   (2) *The coverings.*
      a Shell plating.
      b Inner bottom plating.
      c Deck plating and planking.
      d Wood sheathing.
   (3) Subdivision into compartments, numbering compartments, deck arrangements (in outline), quarters, berthing, engine and boiler compartments, magazines, storerooms.
   (4) Bulkhead construction.

*This course is being remodeled by a board of officers appointed by the Secretary of the Navy.

3. *The construction of the parts of a battle ship*—Continued.
   (5) *Armor fitting and supports.* (Armoring is treated comparatively and critically in third year's course.)
   Ordering armor, preparing molds.
   Armor shelf.
   Framing behind armor.
   Plating behind armor.
   Backing behind armor.
   (5a) Gun-mount fastenings, installation of turret guns.
   (6) Upper works—superstructure, bridges, masts, boat gear, anchor gear, etc.
   (7) *Accessories* attached to hull.
   Bilge keels.
   Docking keels.
   Shaft—Struts and tubes.
   (8) *Openings.*
   In hull below L. W. L.
   In hull above L. W. L.
   In deck above protective deck.
   In deck below protective deck and in inner bottom.
   In protective deck.
   In bulkheads.
   (9) Ventilation. Treated summarily. (Ventilation is treated at length in third year's course.)
   (10) Water service—drainage and pumping. Treated summarily. (Water service is treated at length in third year's course.)
   (11) Rudders and steering gear. Treated summarily. (Same are treated at length in third year's course.)
4. Corrosion and fouling, cementing, painting. Treated summarily. (Same are treated at length in third year's course.)
5. Stresses to which vessels are subjected. Treated summarily. (Same are treated at length in second year's course.)
6. Review of year's work—Examination.

b. Second year.

1. *Introduction.*
   (1) Short review of the whole field and of the work of the first year.
   (2) Outline of the work laid out for the second year.
2. *Ship design.* (Begun.)
   (1) The problem of design—condition to fulfill, nature of service.
   (2) Apportionment of weights to: Hull and fittings, engines and boilers, armor, armament, coal, equipment, margin.
   (3) Determination of coëfficients and dimensions to fulfill conditions.
   (4) Laying down and fairing lines.
   (5) Distribution of weight of armament.
   (6) Distribution of weight of armor.
   (7) Determination of scantling, preparation of midship section.
   (8) Rules of registration societies.
   (9) Calculation of girder stresses.
3. *Features of ship-yard procedure.*
   (1) Laying down and fairing lines.
   (2) Mold loft work.
   (3) Ordering material, taking shell plating off model.
   (4) Laying off.

3. *Features of ship-yard procedure*—Continued.
   (5) Shopwork– bending shed, frame shop, ship shed, smith shop, machine shop, pattern shop, joiner shop, paint shop.
   (6) Transportation, handling, stowing.
   (7) Erection—fitting in place, securing, riveting.
   (8) Completion afloat—placing armor, masts, machinery, etc.
4. *Comparative construction for different types of vessels.*
   (1) Construction of the parts of a battle ship, reviewed.
   (2) Construction of the parts of coast-defense vessels. Comparison with (1).
   (3) Construction of the parts of cruisers. Comparison with (1) and (2).
   (3) Construction of the parts of torpedo vessels. Comparison with (1), (2), and (3).
   (5) Construction of the parts of composite vessels. Comparison with (1), (2), (3), and (4).
   (6) Construction of the parts of sailing vessels. Comparison with (1), (2), (3), (4), and (5).
5. *Boats and anchors*—Stowage, gear, fittings, davits, capstans, windlasses.
6. *Launching*—Execution of.
7. Assemblages—Riveted joints, riveting.
8. Review of year's work—Examination.

c. Third year.

1. *Introduction.*
   (1) Short review of the whole field and of the work of the first and second years.
   (2) Outline of work laid out for the third year.
2. *Ship's design.* (Completed.)
   (1) Internal arrangements completed.
   (2) Calculation and curves of weights, buoyancy, loads, shearing and bending for still water and in waves.
   (3) Calculation for center of gravity, trim.
3. *Comparative construction for different nations.*
   (1) Naval policies—Estimation of naval strength.
   (2) Apportionment of weights.
   (3) Speeds.
   (4) Armor distribution.
   (5) Armaments.
   (6) Lines, hull work, hull fittings.
4. Rudders and steering gear.
5. Ventilation.
6. Water service—Main and secondary drains, fire main, flushing, etc.
7. Auxiliary machinery—Application of steam, hydraulic, pneumatic, electric, and hand power.
8. *Materials of construction.*
   Woods—Construction in wood (brief description).
   Steel—Manufacture and inspection; rolled, forged, cast.
   Iron, brass, bronze, forgings, castings.
9. *Corrosion and fouling;* care and preservation.
10. *Docks and docking.*
11. *Tonnage, gauging.*
12. *Plant*—Location of shops, slips, etc., transportation, machine tools, power distribution, etc.

13. *Estimates*, making of, for cost, labor, and material, for first construction, alterations and repairs.
14. *Administration* and organization in Navy Department, Bureau of Construction and Repair, navy-yards, Department of Construction and Repair at navy-yards, private yards, office of superintending constructor at private yards.
15. Review of year's work—Examination.

B.—Naval Architecture.

a. First year.

1. *Introduction and generalities.*
   (1) Importance of subject, relation to shipbuilding.
   (2) Historic sketch of origin, growth, and development.
   (3) Outline of the scope of the subject, the parts comprised, the method and sequence of treatment.
2. *Ship calculations.*
   (1) Geometrical elements—Areas, surfaces, volumes, centers of gravity, centers of volumes, moments of inertia, radii of gyration.
   Methods of calculation, Trapezoidal rule.
   Simpson's rules, Wooley's rule.
   (2) Displacement calculations, initial stability calculations, curves, displacement sheet.
3. *Statical stability.*
   (1) Analysis of forces at play, condition of equilibrium.
   Transverse metacenter, longitudinal metacenter.
   Classification of methods of calculation.
   (2) Method of calculations, stability sheets, diagrams.
   Method of slices: Benjamin—Spence, McFarlane—Gray, Doyère, Clausel, Fellow, Couwenberg, Rossin, Method Boujion for longitudinal inclinations. Method of wedges: Reech—Risbec, Barnes, Taylor, Daymard—Analytical method of Goyon—Simart.
   (3) Experimental methods—Heck, Blom.
   (4) Forms of diagrams, effect of freeboard, effect of forms, etc.
4. *Dynamical stability*—Methods of estimation—Wind curves.
5. *Effect of alteration of weights.*
   (1) Moving weights on board.
   (2) Adding or subtracting weights.
   (3) Shifting cargoes, water ballast, oil cargoes, free water in hold, flooding.
6. *Floating derricks, floating docks, pontoons, air bags.*
7. *Inclining experiment.*
8. *Use of model*—Law of comparison.
9. *Docking, grounding, hauliug up, heaving down.*
10. *Launching.*
11. Review of year's work—Examination.

b. Second year.

1. *Introduction.*
   (1) Short review of the whole field and of the work of the first year.
   (2) Outline of work laid out for second year.
2. The *surface of buoyancy*—Properties.
3. The *surface of flotation*—Properties.
4. The *surface of slices*—Properties.
5. *Symmetrical, complimentary, and supplementary* surfaces—Properties.

6. *Resistance* in still water, going ahead.
   (1) Resistance of plates—Direct, oblique.
   Experiments—effect of friction.
   (2) Resistance of angular bodies and of shipshape forms.
   Experiments: theories—Scott Russell, Rankine, Simonot, Froude. Stream line theory, augmented surface.
   (3) Frictional resistance.
   (4) Wave-making resistance.
   (5) Eddy-making resistance, wake.
   (6) Effect of shoal water, effect of river currents, squat.
   (7) Air resistance.
   (8) Model experiments—Scale of comparison.
7. *Rolling in still water.*
   (1) Unresisted rolling in still water.
   Condition of stability—Forces at play, determination of moment of inertia of vessel, comparison with pendulum, formula for unresisted rolling.
   Methods of integration—Graphic method.
   Instantaneous axis, movement of metacenter.
   Dipping oscillations.
   Virtual gravity.
   (2) Resisted rolling in still water.
   Conditions of stability—Methods.
   Centers of oscillation.
   Resistances—Fluid resistance, surface friction, keel resistance, waves formed.
   Equation to curve of declining angles, coëfficient of extinction, graphic construction of curve, graphic integration, Rankine's analysis.
   Experiments, methods of conducting same, periods for type vessels, use of models—effect of bilge keels, effect of water chambers, effect of damaged condition, effect of gusts, capsizing.
8. Pitching in still water.
9. Review of year's work—Examination.

c. Third year.

1. *Introduction.*
   (1) Short review of the whole field and of the work of the first and second years.
   (2) Outline of work laid out for third year.
2. Resistance in still water, moving obliquely in a straight line.
3. Resistance in still water, curvilinear movement.
4. *Turning.*
   Action of rudders—fluid pressure, experiments, strains on rudder and steering gear, compensation, forms and dimensions of rudders, effect of screw, turning effect, motion of the vessel in turning, method of determination and representation of movement, turning trials.
5. Rolling in a seaway without resistance.
   (1) Waves—Hydrodynamic principles, theories, trochoidal theory, influence of depth of water, influence of friction, the genesis of waves at sea, effect of force of wind, observation of waves, regular waves, confused sea, tidal waves.
   (2) Unresisted rolling in a seaway.
   Theories—Equation for movement—Graphic determination—Movement under varying initial conditions—Forced synchronism, assuming waves to have form of curve of sines and to have trochoidal form—Rankine's differential equation.

6. Resisted rolling in a seaway.
   Difference between the resistance in still water and in a seaway.
   Method of De Bussy, Graphic method of Froude.
   Results of experiments, Synchronism.
   Effect of speed.
   Effect of turning.
   Effect of firing guns.
7. *Propulsion.*
   (1) Propulsion by steam.
   The powering of ships, methods of determination, coëfficient method, model tank method, independent estimate, Kirk's analysis, curves.
   Analysis of trials, absorption of power, distribution of power.
   The screw propeller, action upon the water, shape of blades, pitch, diameter, slip, efficiency, design of screw propeller to fulfill given conditions.
   The paddle wheel—action upon the water, feathering blades, determination of dimensions.
   Hydraulic propellers, jet propellers, turbines.
   (2) Propulsion by sails.
   Sail spread, center of effort, center of lateral resistance, balancing, stability under sail.
   Action of the wind on sails, effect of heeling.
8. *Vibration.*
   Causes of vibration in ships.
   Comparison with vibrations of rods and strings.
   Period of vibration, nodes.

C.—Practical Work—Drawing Office.

a. First year.

1. Reproduce the given plans of a vessel by taking off table of offsets, laying off from same and fairing.
2. Make displacement calculations and fill out displacement sheets from the table of offsets, construct all curves.
3. Make stability calculations from same plans, fill out stability sheets, construct all curves.
4. Prepare calculations for preliminary design of a battle ship, of a cruiser, of a torpedo boat, powering distribution of weight, armament, armor distribution.

b. Second year.

Design work begun of a battle ship, a cruiser, and torpedo boat; sheer draft completed; midship section with scantling completed; deck plans and inboard profile begun.

c. Third year.

Plans of battle ship, cruiser, and torpedo boat completed, including ventilation plans and drainage plans; Calculations for and construction of displacement and stability curves; Calculations for longitudinal strains in still water and among waves; Equivalent girder construction.

Calculations for center of gravity and for trim.
Docking plans.
Launching calculations and curves.
Stability calculations for damaged condition.
Rudder calculations, diameter of rudderhead

Working up a given inclining experiment from the return of observations taken.

Making out specifications.

D. Programme of Auxiliary Courses.

Auxiliary courses are given in the following academic departments: Department of steam engineering, department of mechanics, department of physics, department of languages; the subject-matter in detail is determined in each case by conference between the officer in charge of post-graduate course and the head of the academic department concerned.

A.—*Outline of the subject-matter in the Department of Steam Engineering.*

First year.

1. Comprehensive scan of the rôle of the steam engine in modern life and its application for marine purposes.
   Historical outline of the development and growth of the steam engine, and of the marine steam engine in particular.
2. Outline of the elements or features of a marine steam engine—boiler, engine proper, condenser, propeller, and shafting.
3. Study of the engine proper.
   Cylinders and their accessories.
   Valves and valve gear.
   Piston, piston rods, connecting rods, guides, crossheads, etc., foundation castings, pillars, crank shafts, line shafts, propeller shafts, etc.
4. The principles and method of procedure in engine design.
   Question of weight, of encumberment, length of stroke, number of revolutions; determination of dimensions of cylinders, pistons, piston rods, etc.
   Distribution of steam and valve design.
5. Practical work in drawing office.
   Reproduction of the principal parts of an engine from plans of a given engine.
   Valve diagrams.
   Calculations preliminary to an engine design.
   Engine design begun.

Second year.

1. Outline review of first year's work.
2. Study of marine boilers, cylindrical and water, tubulous; parts of same and accessories.
3. Principles and methods of procedure in boiler design.
   Boiler dimensions, heating and grate surface, funnel dimensions, scantling, staying, etc.
4. Study of condensers—different kinds, parts of a surface condenser, design of a surface condenser, dimensions, surface, etc.
5. The conduct of trials.
6. Practical work in drawing office.
   Engine design completed, boiler design begun; working up data and curves of a speed trial from the observations taken.

Third year.

1. Outline review of work of first and second year.
2. Study of propellers—the paddle wheel and the screw propeller.

3. Principles and method of procedure in propeller design (to coördinate with study in course in naval architecture).
4. Auxiliary machinery—pumps, fans, etc., lubrication.
5. Heat—thermodynamics (treated comprehensively, not in detail); steam.
   Application of heat to bodies—Application of heat to water.
   Principle of equivalence—Cornot's principle.
   Cycles—reversible and nonreversible.
   Study of the cycle of thermal operations in a steam engine.
6. Combustion and fuels.
7. Procedure and operations in the construction and erection of engines, boilers. condensers; work of foundry, boiler shop, machine shop.
8. Practical work in drawing office.
   Boiler design completed.
   Design of a propeller.

B.—*Outline of subject-matter in the Department of Mechanics.*

First year.

1. Outline of the field—applications in marine construction, both hulls and engines.
2. Hydraulics begun—confined to outline of properties of liquids at rest and in motion; application to a floating body.
3. Dynamics of machines begun—kinetic energy; principle of work; sources of energy, illustrations, application to the steam engine, crank efforts, fluctuations in energy and speed, effect of reciprocating parts, fly wheel, etc.
4. Strength of materials begun.
   Simple resistance; tension, compression; shearing; compound resistance; bending alone, and bending and tension, compression, or shearing, combined, torsion.
   Dynamic resistance, impact.
   Stresses and strains.

Second year.

1. Strength of materials, completed.
   The elastic strength, ultimate strength, elastic elongation, ultimate elongation in tension and compression of the usual structural materials, steel and iron, copper, brass and bronzes, aluminium, tin, zinc, etc., woods, stone, cement, mortar, etc.
   The adaptability of the above materials for the various kinds of structures.
2. Hydraulics, completed.
   Viscosity—frictional resistance on surfaces, loss in flow through pipes, hydraulic motors, hydraulic transmissions of energy, pumps, turbines, action of propellers.
3. Dynamics, completed.
   Friction—sliding friction, friction of bearings and pivots, rolling friction, friction of belts and ropes, of brasses.
   Stresses in machines.

Third year.

1. Pneumatics—properties of gases (in outline).
   Cycle of a pneumatic motor, expansive energy, transmitted energy, efficiency.

2. Statics of Structures.
   Framework—triangular, incomplete, compound strains in loaded structures, beams, framework girders, girders with redundant bars, strains produced by traveling loads.
   Structures of uniform strength.
(3) Kinematics of Machines.
   Kinematic chain—crank chains, screw chains, mechanism of a direct-acting engine, pulley and chain, wheel and axle, rolling contact, endless screw and worm wheel.
   Cams—Ratchets.

C.—Outline of subject-matter in the Department of Physics.

First year (beginning with second term).

1. The Chemistry of Fuels. (Lectures and Experiments.)
   Coal, coke, briquettes, wood, charcoal, petroleum, coal gas.
   Calorific intensity, calorific value.
   Evaporative powers, composition, ash.
   Spontaneous combustion, adaptability for marine purposes.
2. Practical photography—adapted for use in shipyard observation.

Second year.

1. The Chemistry of Structural Metals.
   Metallurgy—lectures and experiments.
   Iron—ores, extraction, cast iron, blast furnaces, wrought iron, puddling, Bessemerizing, steel, cementation, Bessemer process, Siemens-Martin process, crucible steel, Krupp steel, Whitworth steel, nickel steel, casehardening, armor plates, Harvey process.
   Coppers—outline of metallurgy.
2. The Chemistry of Ventilation.
   Amount of air required for respiration and for preservation of material.
   Effect of heating and lighting systems.
   Requirement of service on shipboard.

Third year.

1. Electricity—practical course in generation, transmission, and conversion or utilization of electricity; lectures and experiments; dynamos, motors, conductors, storage batteries.
2. Fouling, corrosion, and preservation.
   Lectures and experiments.
   Phenomena of corrosion—oxidation, galvanic action, corrosion of ship's bottom, attachment and growth of animal and vegetable life; the chemistry of preservation—sheathing, metallic poisons, exfoliation; preservative compositions—white lead, white zinc, red lead, Rathjen's composition, McInnes compositions, other compositions.
3. The Chemistry of lubricants and lubrication.
   Lectures and experiments.
   Liquid lubricants—fatty oils, mineral oils, mixed oils; solid lubricants; corrosion induced by lubricants.

D.—*Outline of subject-matter in the Department of Languages.*

First year—French and German.
Second year—French, German, and Spanish.
Third year—French, German, and Spanish.

All courses essentially practical.

In conjunction with these courses the students, in pursuing the principal courses, will use reference books in the foreign languages as soon as they are competent. In addition, periodical lectures will be given in French.

E.—*Additional features relating to auxiliary courses.*

1. Studies in what may be termed the pure mathematics group are taken only as they come up and are applied to the principal courses.
2. The hours for courses in the academic departments are arranged so as to interfere least with the hours of the academic department concerned, and to fit as far as may be the hours of the principal courses.
3. The courses are by lectures accompanied by the working out of problems or investigations on the part of the students.

   Marks are assigned as the result of examinations as follows:

   (1) Oral examinations or quizzes at various times during the courses.

   (2) Written examinations upon the completion of each main subject or division of the course in question.

   (3) Final written examination upon the completion of each course.

   The oral examinations in a division of a course have, combined, the same weight as the written examination in the division.

   The final examination in a course has the same weight as the oral and written examinations of the divisions of the course.
4. The amount of time given to each auxiliary course is apportioned according to the relative importance of the course in each case, reflected in the multiple assigned.

Schedule of multiples.

Principal courses, combined	800
Auxiliary courses, combined	400
Assiduity	40
Total	1,240
Multiple for academic course	760
Grand total	2,000

Principal courses.

Naval architecture	250
Shipbuilding	250
Summer missions and practical work in drawing office	300
	800

Auxiliary courses.

Department of steam engineering	230
Department of mechanics	80
Department of physics	50
Department of languages	40
	400

The day is divided into two periods, forenoon and afternoon, from 9 a. m. till noon, and from 1 p. m. till 4 p. m. (The afternoon period suspended on Saturdays.)

Four of the forenoon periods and four of the afternoon periods of each week are devoted to the principal courses; namely, forenoon periods on Monday, Wednesday, Friday, and Saturday, and afternoon periods on Monday, Wednesday, Thursday, and Friday.

Two forenoon and one afternoon period remaining in each week are devoted to auxiliary courses.

The afternoon periods are devoted essentially to practical work, and not less than two hours of each are spent in the drawing office.

In addition to the above, four evening periods per week, from 8 p. m. till 9 p. m., are devoted to the department of languages.

Schedule for auxiliary courses:

First term.

Forenoon period Tuesday:
- Two hours to department of steam engineering.
- One hour to department of mechanics.

Forenoon period Thursday:
- Two hours to department of steam engineering.
- One hour to department of mechanics.

Afternoon period Tuesday:
- Department of steam engineering.

Second term.

Forenoon period Tuesday:
- One and one-half hours to department of steam engineering.
- One and one-half hours to department of mechanics.

Forenoon period Thursday:
- One hour to department of steam engineering.
- Two hours to department of physics.

Afternoon period Tuesday:
- Department of steam engineering.